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Author(s): Whitworth, Julia
Lloyd, Jane Alexandria
Majors, Harry W.

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Fissile Material Disposition Program

MOX Irradiation, Feedstock, and Transportation

ARIES Oxide Production Program

Assessment of Risk to Long-term Sustainable Production Rate

Revision 1

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APPROVALS

Julia Whitworth 4/25/17

Julia Whitworth — Date
ARIES Oxide Production Program Manager (LANL)

Jane Lloyd 4/25/17

Jane Lloyd — Date
Technical Project Manager – ARIES Oxide Production Program (LANL)

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History of Revisions

Revision 0	FY-16 draft- not issued
Revision 1	Incorporate the results of work performed in 2016. Consolidate risks that are common to many ARIES modules into single risks.

Summary

This report describes an assessment of risks and the development of a risk watch list for the ARIES Oxide Production Program conducted in the Plutonium Facility at LANL. The watch list is an active list of potential risks and opportunities that the management team periodically considers to maximize the likelihood of program success. The initial assessments were made in FY 16. The initial watch list was reviewed in September 2016. The initial report was not issued. Revision 1 has been developed based on management review of the original watch list and includes changes that occurred during FY-16.

1.0 Introduction

The ARIES Oxide Production Program at LANL supports the Office of Materials Disposition in the office of Material Management and Minimization (M3) by converting Pu metal into oxide that complies with the specifications for the Mixed Oxide Fuel Fabrication Facility (MFFF). This report discusses the evaluation of risks associated with the production of Pu oxide at LANL. The scope of the risks discussed includes risks to major operations, including disassembling Pu components, converting the Pu metal to oxide, milling and blending the oxide, sampling and characterizing the oxide, and packaging the oxide into long-term storage containers. The risks also include those associated with the data collection and certification processes. The characteristics and requirements for the oxide produced by LANL are described in ICD-08-025-02 G-ESR-K-0039, *Los Alamos National Laboratory-Savannah River Site (K-Area Complex and/or Mixed Oxide Fuel Fabrication Facility) Plutonium Dioxide Powder Interface Control Document*. The activities in the Plutonium Facility occur early in the material disposition execution. Therefore risk reduction of LANL activities increases the potential for risk reduction of subsequent operations at other DOE facilities that are dependent on the ARIES product.

The product that meets the MFFF specifications (i.e., the ICD) is raw material for processing into commercial reactor fuel. If the end disposition of the product is revised for some other end state such as down-blending and geological disposal (dilute and dispose), ARIES processes will be subject to changes in production rates and specifications. The risk assessment and watch list generation may be repeated for the affected processes.

2.0 Risk Assessment Process

The production risk watch list is based on the following:

- IPM-16-011, *ARIES Oxide Production Program FY16 Program Management Plan, R7,* April 1, 2016 (PMP);
- IPM-15-030, *ARIES Oxide Production Program Risk Management Plan*, Dec 23, 2015 (RMP); and

- IPM-14-033, *ARIES Oxide Production Program Minimum Capability Plan,* August 15, 2014 (capability plan).

The current scope of the program is the disassembly and conversion of plutonium metal to oxide. The risks evaluated include:

1. risk to the ability to achieve capability plan oxide production rates, and
2. opportunity to improve production rates.

This report also considers the possibility of future program changes requiring an increase in production.

The following general assumptions were used as the basis for risk identification and assessment:

1. risks are evaluated based on expected conditions through FY 22;
2. total production rate remains the same for the next five years;
3. the current oxide specifications will not become more restrictive;
4. a consistent level of funding is maintained as defined in the capability plan (IPM-14-033) over the next five years;
5. ARIES annual processing will continue at the level described in the capability plan;
6. the LANL Plutonium Facility will remain operational;
7. the space in the Plutonium Facility currently used by ARIES will continue to be available and accessible;
8. outside regulatory requirements will not experience significant changes over the next five years; and
9. Quality requirements will not increase over the next 5 years.

2.1 Identification of Risks

Risks were identified by interview and discussion (brainstorming during FY 16) with the process engineers (PrEs), subject matter experts, management staff, and operators for each ARIES operation (identified in the capability plan and PMP). Using the guidance of IPM-15-030, *ARIES Oxide Production Program Risk Management Plan* (RMP), the identified risks to production were ranked according to likelihood and consequences. The results of the brainstorming and ranking are presented in Appendix 1, Oxide Production Risk Brainstorm Summaries. Appendix 2 describes individual Risk/Opportunity Evaluations. The individual risk evaluations have been updated for the current revision of this report.

2.2 Risk Handling

Four strategies are considered for addressing the identified risks or opportunities. The risk/opportunity handling strategies are avoid, transfer, mitigate (opportunities use the term “implement” instead of “mitigate”), or accept. The strategy for addressing the risk/opportunity is not the sole consideration for an item’s placement on the risk watch list.

Avoidance, as a risk handling strategy, is done by planning the project activities in such a way as to eliminate the potential threat.

Risk transference is an action taken when an identified risk can be assigned to another party. For this project, transfer of risks applies to items outside the project's control and usually under the control of interfacing laboratories or the NNSA.

Mitigate (implement for opportunities) is a risk handling strategy taken to reduce the likelihood of occurrence or consequence of an identified negative threat, or to implement conditions that increase the likelihood of occurrence or benefit of an identified opportunity.

Risk acceptance indicates that the project has decided not to implement a handling strategy either because a suitable response strategy is not known or the response strategy would not be cost effective.

2.3 Risk Assessment Process Categories

The production risks were assessed in the following broad categories (based on the PMP): processing, overall or cross-cutting, program management, and engineering support. Processing was split into additional areas to align with the unique operations identified in the PMP and the capability plan. These additional areas are: pit disassembly, Pu conversion by direct-metal oxidation (DMO), Pu conversion by muffle furnace, oxide processing (milling, blending and characterization), packaging, nondestructive analysis, and shipping and receiving. Some risks that affect multiple areas (for example storage and material movement) have been consolidated into single items.

After conducting the risk identification brainstorming, the ARIES program management team prioritized the risks and evaluated the opportunities relative to the ability to maintain or increase production. The risks were then re-evaluated based on experience and changes that occurred during FY 16. The results are discussed in Section 3.

2.4 Other Risks

Some risks to production are outside of the ARIES program scope. They include risks associated with operation of the facility and its place within the DOE/NNSA Complex. The assumption of this risk assessment is that requirements for, and services to, the ARIES Oxide Production Program will remain stable over the next 5 years. The facility organizational support is funded by a variety of programs that mutually depend on the organizational infrastructure.

The risk assessment acknowledges the potential for production risks from support functions, some of which are addressed with the program management risks.

Facility organizational support functions include:

- formality of operations at LANL (includes conduct of operations, maintenance, training, and engineering);

- the Nuclear Criticality Safety Program;
- the Material At Risk Program;
- radiation protection and the ALARA Program;
- waste management and processing; and
- product verification, submittal and acceptance by LANL

2.5 Risk Status and Watch List Development

The risk status describes the level of monitoring assigned to the risk or opportunity. The status is described as active, inactive, closed or completed, or watch list.

Active risk mitigation or opportunity implementation represents activities that are currently being pursued through the normal work control process. The management team may add some of the active risks to the watch list when their judgement is that additional monitoring of the item is beneficial, such as when the mitigation is of a multi-year duration.

Inactive status risks or opportunities are those for which there are no current work activities to mitigate the risk or implement the opportunity. Many are identified risks that are outside the scope of control of the program. The management team may add some of the inactive risks to the watch list when their judgement is that additional monitoring of the item is beneficial.

Closed/Completed status represents individual risks that are no longer being actively monitored. This can be because a mitigation activity has been successfully completed or it can be because the risks have been incorporated into a more general risk or activity. For example, many module leaders identified the risk of personnel loss. These individual risks were combined into a single risk to address maintaining personnel for the entire program, with each individual risk being "closed."

The Risk Watch List comprises the following:

1. Items that are not currently being managed but are deserving of attention.
2. Routine issues that have the potential for becoming more serious if not monitored (such as customer product acceptance).
3. Issues that are currently being actively addressed but need increased scrutiny because of the scope of the issue.

The results of the brainstorming activities and management team risk prioritization were used to develop specific items for inclusion on the risk watch list. Items that were judged to be opportunities and items that were not yet in the process of being mitigated were considered for inclusion on the watch list. Items that are being actively addressed under current work packages were added to the watch list at the discretion of the management team.

The "accept" strategy was applied to a number of items that were potential risks to production but were outside of the program's control. Some of these "accept" strategy items were added to the watch list. In some cases, the watch list combines similar risks into a single item (e.g. staffing, spare parts, storage, criticality analysis).

Some items for which the risk strategy was to accept the risk were added based on the request of ARIES oxide production program management.

3.0 Risk Summaries

3.1 Program Management Risks

Risks associated with TA-55 infrastructure, facility programs (safety, criticality safety, waste management, material control and accountability, dose control, records, administrative, etc.) and specific projects (engineering and plant modification projects benefiting oxide production) are managed through the ARIES Oxide Production Program office. These include facility organizational support activities listed in Section 2.4. Because the ARIES program is a relatively small part of ADPSM activities, it does not have significant influence on the impact of these activities on oxide production. Consequently, program management must accept this type of risk but remain aware of how changes in those activities can affect oxide production. This category also convers external programmatic risk such as mission changes and funding shortfalls.

Risks associated with the activities identified above were assessed with the program management risks, and are included in the program management portion of Appendix 1. The program management risks also include the inherent risks associated with the assumptions used as the basis for the production modules.

The initial assessment of risks by individual process engineers resulted in the identification of common risks (such as maintaining staff). Revision 1 of the report reflects the consolidation of risks that are common into single items.

Risks

The following program management risks are noted:

1. *Mission changes*

The identified risk encompasses changes to the:

- production rate outside the bounds of the *ARIES Oxide Production Program Minimum Capability Plan*,
- MFFF oxide requirements, and
- mission increase to include dilution and disposal (which could increase the current overall mission by more than an order of magnitude).

The risks will be monitored by program office participation in the mission decision processes.

2. Facility/regulatory restrictions

The identified risk includes:

- regulatory requirements,
- LANL-imposed operational requirements,
- LANL policy changes,
- competition for facility resources,
- pause in PF-4 operations or changes in processing room and storage space availability, and
- changes in equipment accessibility.

Some of these risks are outside the scope of program control and must be accepted, although the program office engages in priority efforts for facility resources. However, because competition with other programs is likely, the risks were acknowledged.

3. Curtailment of TRU waste generation and changes to waste management costs.

Major changes to the TRU waste management process at TA-55 have occurred in the past three years, simultaneously with the construction and readiness review of the new TRU Waste Facility. As an example, new TRU waste characterization requirements may be implemented for WIPP disposal authorization. As a result, increased costs compared with the past cost structure are possible, as are delays in the availability of storage space for such waste, which could require curtailment of waste-generating activities such as normal programmatic operations.

4. *LANL Contract change* within the next three years could affect productivity and personnel availability.

5. *Unknown external shipment date for oxide product shipments to South Carolina.*

Current program requirements state that LANL will be able to ship oxide to SRNS no later than 2023, but this is contingent on smooth resumption of WIPP operations, the outcome of a lawsuit by the state against DOE, and other unpredictable factors. This requires LANL to store all oxide produced onsite.

6. Possible need for Uranium processing

Currently, only non-Uranium items can be regularly processed under the ARIES program. The Uranium electro-decontamination system must be restarted through a readiness review and needs a criticality evaluation and a process engineer, but program funds are not available for this effort.

Opportunities

1. Reduction of Requirements

The LANL/MFF ICD is annually reviewed and opportunities to reduce or eliminate requirements based on previous data or better understanding of requirements are pursued when they present cost or schedule-saving possibilities.

2. *Material Control and Accountability*

Material control and accountability requirements are a necessary part of processing plutonium. Efforts to meet MC&A requirements (such as inventories) in a manner that is convenient to oxide production processes provide some opportunities for more efficient operation. For example, the ability to account for the mixing of DMO oxide and oxide produced from the muffle furnaces. The resolution of this MC&A restriction on mixing increases the flexibility for using various oxide preparation sources (e.g., DMO and muffle furnace). In addition, decreasing the frequency of inventories, which currently shut down operations for six weeks out of the operational year, would increase operational time.

The following are additional current opportunities that reduce risk:

- development of electronic data sheets will provide a basis for reducing the obstacles to product verification, submittal and acceptance;
- performance of new criticality analyses may allow more flexibility in processing by providing a technical basis for increasing criticality safety limits for important processes;
- seismically anchoring safes and monitoring the need for more safes (safe storage is necessary for uninterrupted production, but is not sufficient by itself to address the need for in-line storage.);
- operating under the new criticality restrictions will identify additional opportunities to improve productivity by performing criticality analyses that support relaxation of the new criticality limits.

3. Maximize production

Production could be increased using the existing or planned equipment suite with additional personal and if more storage space can be identified. This would mitigate several processing risks and potentially shorten the lifecycle of the program.

3.2 Processing Risks

3.2.1 Pit Disassembly

The robotic lathe has performed reliably since 2009, but failures of complicated equipment such as this can require long repair times. Single-point failures represent significant risks. In this case, a second disassembly lathe (applicable to a limited number of pit types) is being installed. The second lathe will mitigate the single-point failures for the robotic lathe, but it is not scheduled for completion through readiness until 2019. A third lathe virtually identical to the robotic lathe is also being assembled in cold lab space for use in training of new personnel and as a source of spare parts.

Risks

The following pit disassembly items were noted:

Lack of Staging and storage of Pu parts limits the ability of the robotic lathe to maximize its productivity, especially when oxide conversion processes are not available to accept pit disassembly (PITD) output.

Actively Mitigated Risks

Staffing—retirement of the current PrE (with 25 years of ARIES experience) is anticipated and a replacement PrE is preparing to take his place.

Disassembly equipment single-point failure—a backup pit disassembly lathe (pit cutter) is being installed and is expected to begin operation in FY19. Additionally, a second lathe is being installed in cold laboratory space.

3.2.2 Plutonium Conversion–DMO

The two DMO furnaces provide a redundant capability at the current production rate. Staffing is sufficient to operate either system, but not sufficient for concurrent operation of both. Muffle furnaces, that can also perform conversion, mitigate the risks of problems with the DMO process.

Risks

The following DMO items are noted:

Staffing is not sufficient for operation of both DMO-2 and DMO-3.

DMO-2 limited-volume circulating chilled-water system (*LVCCWS)* installation is important, but should be monitored to minimize production risks during the installation, which is scheduled for FY 17 after production of scheduled oxide.

Comprehensive spare parts must be maintained because the two furnaces have a number of limited-life components. Reliable operation depends on the ability to maintain spare parts for preventive and corrective maintenance. This becomes more important if production rates increase.

DMO-3 LVCCWS installation was completed in FY16 and resumption of operation in FY 17 is pending re-start requirements. DMO-3 has never operated under normal conditions for production purposes. It will go through readiness assessment in FY 17.

DMO-2 controller and furnace body both need to be replaced if the furnace is to continue operating for the next five years.

Opportunities

Sufficient staffing could be provided to allow simultaneous operation of DMO-2 and DMO-3 to exceed production schedule and build contingency product inventory against future risks. However, storage of excess product is problematic.

3.2.3 Plutonium Conversion–Muffle Furnace

There are three muffle furnaces available for Pu conversion to oxide. These furnaces offer a diverse method of Pu conversion to oxide from that of the DMO furnaces.

Oxide production from the DMO or muffle furnaces depends on the ability of the product to be stored or passed to the next process. This has not been a problem for the current, low production rate, but provision of storage capacity could improve the use of the various oxidation furnaces.

Risks

The following muffle furnace risk items are noted:

Comprehensive spare parts must be maintained because there are three muffle furnaces and reliable operation will depend on sufficient spare parts to assure operation.

The aging control system is scheduled to be replaced in FY17 due to frequent problems and failures during operation.

3.2.4 Oxide Processing and Characterization

Most of the equipment constitutes single-point failure for which the operation stops until the equipment is repaired or replaced.

Sieving, milling, and blending are critical functions for processing. Spare equipment for these operations is available, and long delays (relative to the current production) are not anticipated if equipment becomes inoperable.

The oxide characterization equipment is also standard laboratory equipment but, if it fails, it may be more complicated and time-consuming to replace. Because samples can be archived for later analysis, the consequences of failures in oxide characterization equipment are less immediate.

Risks

The following oxide processing and characterization risk items are noted:

Particle size analyzer is no longer supported by the vendor and needs replacement, for which a spare unit was purchased in FY16; it is necessary for product acceptance but does not immediately stop production.

TGA Simultaneous thermal analyzer is potentially a single-point failure; it is necessary for product acceptance but does not immediately stop production.

Opportunities

Pre-planning replacement of items that are single-point failures is an opportunity for reducing the effects of failures.

- *Spare parts*—a comprehensive store of spare parts and replacement instruments will reduce risks of prolonged equipment unavailability.

3.2.5 Packaging

Packaging receives the material from oxide processing and characterization and encloses it in a multiple layer packaging system consisting of a crimped convenience can, a welded inner container, and a welded outer container.

The crimper and outer can welder will stop production if they fail. Because the outer can welder is located outside the contaminated glovebox line, the ability to repair it is considered enhanced. A failure of the crimper is likely to require extensive downtime and represents one of the most significant risks to packaging.

The inner can (IC) welder and decontamination systems have in-line backup capability from the Robotic Integrated Packaging System (RIPS).

The installed equipment is considered sufficient to maintain the current production rate.

Risk

The following packaging risk items are noted:

The outer can welder is a single-point failure item. Some spare parts are available and maintenance is less complicated because it is not contaminated.

The *electrodecontamination system* has a backup in RIPS, but is one of the limiting items in packaging throughput. Currently, there is only one qualified operator; three cross trained operators are needed, for reliable operation.

Actively Mitigated Risks

Compagnie Générale des Matères Nucléaires *(COGEMA) Can Crimper* is a single-point failure item and the backup crimper has yet to be delivered to LANL. This is a risk that needs to be followed until the backup crimper is available.

3.2.6 Nondestructive Assay

In addition to the ARIES NDA table in the operating room, the facility also maintains a nondestructive assay (NDA) capability. Therefore, the risks associated with failures of the ARIES NDA capability are mitigated by the capability of the facility.

It is likely that the ARIES NDA capability will continue to be unavailable during the initial production period after resumption of operations. This will cause extra processing,

mainly due to material movement, but is not expected to prevent achieving production rates.

Risks

The following ARIES NDA items are noted:

NDA criticality analysis - ARIES NDA is waiting on completion of criticality analysis for the NDA table in the main operating room and approval of criticality limits for the operation. However, it is lower on the priority list for more complex CSEDs. Consequently, processing relies on the facility's NDA capability, which requires more movement of material through the plant.

Possible changes in containers from 3013 to SAVY – As a result of mission change, it is possible that the program could change from using 3013 cans to SAVY containers. If so, the impact on the NDA table operations and robot would need to be assessed.

3.2.7 Shipping and Receiving

This process is essential for both ends of the processing system. The importance of shipping and receiving is magnified by the limited amount of storage space for both the incoming and outgoing material.

The shipping containers are also the containers used for storage of the final products at Savannah River Site. The current supply of these containers is insufficient for the expected production over the next 5-6 years. However, this is easily remedied by procurement of additional shipping containers.

Risk

The following shipping and receiving items are noted:

The number of 9975 shipping containers will likely be expended within the next 5 years if projected production rates are achieved. The supply of shipping containers should be watched to assure adequate lead time if additional containers are needed.

Actively Mitigated Risk

The program is expected to change from using FL containers to MD-2 containers for transfer of material from Pantex to LANL. A project started in FY16 and continues in FY17 to purchase new cranes for the larger container. Installation will likely occur in FY18.

Opportunity

Provision of more storage for arriving items can reduce the cost of shipping and risks due to delays in shipping. A storage cage was completed in FY 16 to augment facility storage for incoming shipping containers.

3.2.8 Cross-cutting Processing Risk

Actively Mitigated Risk

The following cross-cutting items are noted:

Conveyor –to-glovebox shuttle system - is being redesigned in FY17 for more reliable operation.

Modifications to reduce water ingress into gloveboxes have been designed and tested but need to be installed in FY17.

3.3 QA Support Risks

The quality support organization (PAQ) provides quality engineering that works along with the technical project manager (TPM) to generate and approve the project quality implementation plan. It is the basis for assuring that requirements from ICD-08-025 G-ESR-K-00039 are identified and implemented for each product delivered to the customer.

The results of this work are reflected in the certificates of analysis and conformance prepared by the quality engineer in accordance with customer-approved procedures, and the certificate of acceptance prepared in accordance with the Associate Directorate for Plutonium Science and Manufacturing (ADPSM) policy. ADPSM has established a new standard process for this activity, PA-MAP-01004, *Preparation and Review of a Product Data Package*.

The QA support function administers and assures that customer QA requirements are maintained. This is accomplished through interface with the customer's quality organization to identify and address customer quality issues. QA support also maintains the quality program approval of vendors providing technical support for product requirements and provides interface with institutional quality requirements to assure that the program addresses LANL quality program commitments.

Product acceptance by the customer, based on the product analysis performed by LANL, has previously been successful. Future acceptance based on product analysis performed by SRNL and additional verification, submittal and acceptance by procedure PA-MAP-01004 are new activities that are anticipated to cause some initial difficulties (associated with delays in verification, submittal and acceptance) as they are used for the first time.

Risk

Within the category of Programmatic risk, the following QA risk is noted:

New processes for programmatic quality verification pose a risk to the timeliness of the product verification, submittal and acceptance process until the requirements are fully implemented and accepted by the customer.

Problems in the ARIES QA program or supporting organization could result in non-compliances that cause re-work of blend lot production. Frequent QA program audits and surveillances by MOX Services allow for close monitoring of this risk.

3.4 Overall/Cross-Cutting Risks

Engineering provides an overall broad cross cutting support function for ARIES oxide program work. The function is necessary for assuring that long-term capability is maintained. The maintenance of robust engineering support assures that equipment maintenance, replacement, and operation continue with minimum interruption. The engineering function at LANL is governed by engineering standards and processes, but the function applies to the program through the Process Automation and Control Group (AET-5), the Equipment Installation Group (NPI-8), and the individual process engineers who work directly with the program (MET). Specific engineering projects and engineering support for spare parts, corrective maintenance, and configuration management are necessary to keep a capability for responding to unforeseen circumstances and to implement opportunities for improvement.

Many processing risks are not immediate. They represent risks to improvements or risks to the ability for responding to unforeseen circumstances.

Actively Mitigated Risks

The following engineering and overall cross-cutting support items are noted:

Spare parts comprehensive list development and procurement

Staffing

Maintenance plans

Development of new control systems on a roughly five-year schedule for most major equipment.

Restrictions due to new criticality controls

The effects of recently changed criticality limits will need to be monitored to evaluate both their effects and to determine the most effective ways of relieving their effects on processing. This includes resources for preparation of new CSEDs. Throughput analysis being performed in FY17 will further inform this risk.

Storage and movement of material

The facility requires greater in-line storage of material during operations due to lower FMO criticality limits and more storage for certified 3013 containers of oxide product that cannot be shipped offsite until 2023 at the latest. Options for increasing storage in both cases are being studied in F17.

4.0 Acronyms

Acronym	Term
ADPSM	Associate Directorate for Plutonium Science and Manufacturing
ALARA	As Low As Reasonably Achievable
ARIES	Advanced Recovery and Integrated Extraction System
COGEMA	Compagnie Générale des Matères Nucléaires
CSED	Criticality Safety Evaluation Document
DMO	Direct Metal Oxidation
DOE	Department of Energy
ICD	Interface Control Document
LANL	Los Alamos National Laboratory
LVCCWS	Limited Volume Chilled Cooling Water System
MC&A	Material Control and Accountability
MFFF	Mixed Oxide Fuel Fabrication Facility
NDA	Nondestructive Assay
NNSA	National Nuclear Security Administration
PITD	Pit Disassembly
PMP	Program Management Plan
PrE	Process Engineer
RIPS	Robotic Integrated Packaging System
RMP	Risk Management Plan
TA	Technical Area
TPM	Technical Project Manager
TRU	Transuranic Waste
WIPP	Waste Isolation Pilot Plant

5.0 References

Document Number	Title
IPM-16-011	Oxide Production Program FY16 Program Management Plan, R7
IPM-15-030	ARIES Oxide Production Program Risk Management Plan
IPM-14-033	ARIES Oxide Production Program Minimum Capability Plan
PA-MAP-01004	Preparation and Review of a Product Data Package
ICD-08-025-02, G-ESR-K-00039	Los Alamos National Laboratory –Savannah River Site (K-Area Complex and/or Mixed Oxide Fuel Fabrication Facility) Plutonium Dioxide Powder Interface Control Document

Appendix 1, Oxide Production Risk Brainstorm Summaries

Summary of Risk Brainstorm Results for Packaging					
Title	**Description**	**Rank L/C[1]**	**Consequence**	**Strategy Avoid, Transfer, Mitigate, or Accept**	**Comments**
Compagnie Générale des Matères Nucléaires (COGEMA) crimper (single-point failure)	The event is failure of the crimper such that successful crimping of the convenience can becomes uncertain or impossible. This motor-driven crimper has been in service for over 10 years.	M/H[2]	Packaging ceases until (1) a replacement or repaired crimper is available, or (2) permission is received to have poorly crimped COGEMA containers.	Mitigate	These crimpers are provided from COGEMA through MOX Services. A backup crimper has been on order for over 4 years. The LANL convenience can crimper is installed, but use of the LANL convenience can is not approved for this program. The LANL can crimper could possibly be used as an emergency backup.
COGEMA convenience can availability	The event is the loss of the use of the COGEMA convenience can due to depletion of the available inventory or a change in packaging requirements.	L/H	Packaging ceases until a substitute convenience can is procured along with a new crimper and procedures.	Accept	The current inventory is approximately 380 cans. These were furnished by MOX Services. At the current rate, these are expected to be sufficient for the next 5 years. Additional cans are not expected to be available. If more are needed, they would need to be procured from another source.

Summary of Risk Brainstorm Results for Packaging (continued)					
Title	**Description**	**Rank**	**Consequence**	**Strategy**	**Comments**
Inner can (IC) welder	The event is the loss of the ability to weld ICs using the IC welder.	L/L	Packaging ceases without the ability to perform IC welding. There are two welders available for welding the IC. The consequence of losing the primary IC welder is that the Robotic Integrated Packaging System (RIPS) welder would become the primary IC welder.	Accept	The new IC welder was installed in 2015; the RIPS welder provides redundancy. A spare welder is used in the cold lab for weld development and training. The spare welder is also available for spare parts.
IC availability	The event is the depletion of the inventory of ICs and lids.	L/H	Packaging ceases.	Accept	LANL currently has approximately 450 ICs in storage. At the current rate, these are expected to be sufficient for the next 5 years.
Leak testing the IC	The event is inability to perform leak testing per the packaging time limit requirements for the hot leak test after IC welding.	L/M	Failure to meet packaging requirements.	Accept	The leak test station is located in a different room than the IC welder. Delay in transfers to the hot leak station can occur. There are 4 leak detectors available for use, but the trolley and room availability drive the risk.
Leak test equipment failure	The event is failure of the leak test chamber or attached helium leak detector.	L/M	Failure to meet packaging requirements.	Accept	The leak test chamber is a passive unit with a replaceable gasket. There are 4 leak detectors available for use.

Summary of Risk Brainstorm Results for Packaging (continued)					
Title	**Description**	**Rank**	**Consequence**	**Strategy**	**Comments**
Electro-Decontamination System (EDS) equipment failure	The event is EDS failure (mechanically or control system).	M/M	Packaging ceases due to loss of the ability to decontaminate the IC.	Accept	The primary EDS is original to ARIES startup (pre-1998), although it has had controller upgrades (2015) and mechanical maintenance. RIPS provides a backup EDS capability. Mechanical portions (valves, pumps, gauges, etc.) are maintained, but are used to failure.
Outer can welder (OCW) (single-point failure)	The event is failure of the OCW control system or mechanical system.	M/H	Packaging ceases.	Accept	LANL has spare parts and access to the OCW for repairs.
Outer can availability	The event is depletion of inventory of outer cans and lids.	L/H	Packaging ceases.	Accept	LANL currently has approximately 520 outer cans in storage. At the current rate, these are expected to be sufficient for the next 5 years.
Personnel availability	The event is loss of skilled personnel due to aging workforce and loss of people to retirement and lack of retention.	M/L	Loss of people slows production and increases cost. Sufficient personnel are cross-trained such that no single loss will stop production.	Accept	LANL has a staffing plan; the current staffing level for the packaging team is sufficient.

Summary of Risk Brainstorm Results for Packaging (end)					
Title	**Description**	**Rank**	**Consequence**	**Strategy**	**Comments**
Certified personnel availability	The event is loss of certified welders, leak testers, and visual inspectors.	L/M	Packaging ceases without certification until recertified personnel become available.	Accept	Current Laboratory programs for maintaining certifications have a sufficient number of certified workers in the packaging workforce.

[1]Likelihood/Consequence
[2]Ranks are low (L), moderate (M), and high (H).

Summary of Risk Brainstorm Results for PIT-Disassembly (PITD)					
Title	**Description**	**Rank L/C[1]**	**Consequence**	**Strategy Avoid, Transfer, Mitigate, or Accept**	**Comments**
Robotic lathe (single-point failure)	The event is failure of the robotic lathe. The robotic lathe is used to disassemble items; it has been in service since 2009. Loss of the robotic lathe stops material processing for this module.	**M/H[2]**	Processing stops if the robotic lathe is out of service. There are no alternatives for material preparation. Downstream processes may continue if feed material has been accumulated	Mitigate	The pit cutter will provide an alternate capability for this module when it is installed in 2018.
Software	The event is failure of the robotic lathe software or software systems. Failure of the software stops the robotic lathe.	**M/M**	Processing stops	Accept	The software on the current lathe was upgraded in 2015. A backup version of the software is stored on–line, but needs to be placed in the TA-55 software inventory.

Summary of Risk Brainstorm Results for PITD (continued)					
Title	**Description**	**Rank**	**Consequence**	**Strategy**	**Comments**
Spare parts	The event is system downtime because maintenance or repair cannot be achieved due to lack of spare parts.	**L/M**	Processing is delayed due to unavailability of a spare part resulting in long downtimes for the robotic lathe.	Accept	An inventory of spare parts is being maintained. The installation of a second robotic lathe in the cold lab will enhance the availability of long lead time, expensive spare parts. The spare parts inventory during the past 8 years of operation has been sufficient to keep the lathe in operation.
Special nuclear material (SNM) staging area	The event is lack of storage space causes processing to stop. When downstream oxidation systems are not available, the SNM from PITD is stored; that storage space is limited. When post-disassembly storage space is not available, continued operation is stopped.	**H/L**	The limited storage space provides some buffer for the oxide production process. Once the storage space is filled, use of PITD is limited to the rate of oxidation.	Accept	The current storage space is full, which prevents continued operation.

Summary of Risk Brainstorm Results for PITD (end)					
Title	**Description**	**Rank**	**Consequence**	**Strategy**	**Comments**
Material transfer	The event is the unavailability of the elevator, trolley, or conveyor to move items.	**M/L**	Manual movement is possible when these systems are inoperable, but represents an increased use of manpower and a decrease in productivity.	Accept	Material is transferred to and from this module using the elevator, trolley, and conveyor systems. They are not always available. SNM storage space provides some buffer to downstream operations during delays due to outage of material transfer systems.
Staffing	The event is the loss of qualified persons to maintain and operate the system. The module process engineer (PrE) will retire in 2016.	**H/M**	System operation requires qualified personnel and technical support. The PrE is responsible for the engineering basis of the module and is essential to long-term continued operation of the function. Trained technicians are necessary for unit operations.	Mitigate	A replacement PrE has been designated. Lathe and equipment operators must be maintained and qualified as glovebox (GB) workers and fissile material handlers (FMHs). Technicians are in formal training programs to maintain GB worker and FMH qualification. The new lathe in the cold lab will be used to maintain training on the operation of the equipment.

[1]Likelihood/Consequence
[2]Ranks are low (L), moderate (M), and high (H).

Summary of Risk Brainstorm Results for Shipping and Receiving					
Title	**Description**	**Rank L/C[1]**	**Consequence**	**Strategy Avoid, Transfer, Mitigate, or Accept**	**Comments**
Pit storage	The event is failure to obtain storage for pits arriving for ARIES processing.	M/M[2]	Increased cost due to the necessity of more shipments containing fewer pits.	Accept	The main cause of limited storage is the inability to ship waste to WIPP.
Upgrade to shipping and receiving for MD-2 type container	The event is delay of scheduled upgrades for use of the MD-2 type container.	M/L	The current model FL container can continue to be used.	Accept	The upgrade design is on schedule for FY16 and construction is expected in FY17.
Availability of 9975 containers	The event is depletion of the inventory of 9975 containers, by use or failure of Savannah River Site (SRS) to perform maintenance.	H/H	Shipments stop if the containers are not available.	Mitigate	Additional shipping containers will be needed if the anticipated shipping rate is achieved. Excess 9975s are maintained at SRS.
Ability to use 9977 containers	The event is the inability of SRS to accept 9977 containers.	L/L	Loss of the opportunity for more efficient transportation and a more rapid depletion of the limited number of 9975 containers.	Accept	SRS is expected to be able to accept 9977 containers with dual 3013 packages.

Summary of Risk Brainstorm Results for Shipping and Receiving (end)					
Title	**Description**	**Rank**	**Consequence**	**Strategy**	**Comments**
FS-65 container storage and surveillance	The opportunity is disposal of the unirradiated fuel elements in the FS-65 storage container.	L/L	Reduce the cost of continued surveillance and gain storage space occupied by the FS-65.	Accept	No identified path forward. Options are being considered by NA-23.
Personnel availability	The event is loss of qualified packaging and shipping personnel.	M/L	Shipping is delayed.	Accept	Backup packaging engineer is being trained. Authorized shippers and packaging engineers are available from other teams. Fissile material handlers and leak testers are available from the Plutonium Facility.

[1]Likelihood/Consequence
[2]Ranks are low (L), moderate (M), and high (H).

Summary of Risk Brainstorm Results for Pu Conversion-DMO					
Title	**Description**	**Rank L/C[1]**	**Consequence**	**Strategy Avoid, Transfer, Mitigate, or Accept**	**Comments**
DMO-2 Operation					
Oxidizer furnace	The event is oxidizer furnace failure due to loss of a major component such as the furnace body, lid, heater elements, basket, auger, auger motor, or basket motor.	M/L[2]	Operation of DMO-2 would be stopped.	Accept	DMO-3 and muffle furnace oxidation provide a backup capability. Augers, motors, heater elements, and the basket are likely to need replacement during the next 5 years. Consequences are low at the current production rate.
Calciner furnace	The event is loss of the DMO-2 calciner furnace, furnace tube, auger, or offload assembly.	M/ L	Operation of DMO-2 would be stopped.	Accept	DMO-3 and muffle furnace oxidation provide a backup capability. Auger and heating elements are likely to require replacement within the next 5 years. Consequences are low at the current production rate.
Vacuum pump	The event is loss of the DMO-2 vacuum pump, system piping, or control system.	M/L	Operation of DMO-2 would be stopped.	Accept	DMO-3 and muffle furnace oxidation provide a backup capability. Replacement is likely within the next 5 years, but consequences are low at the current production rate.

Summary of Risk Brainstorm Results for Pu Conversion-DMO (continued)					
Title	**Description**	**Rank**	**Consequence**	**Strategy**	**Comments**
Control panel	The event is the loss of the control rack, including the programmable logic controller (PLC) and associated instrumentation.	L/M	Operation of DMO-2 would be stopped.	Accept	DMO-3 and muffle furnace oxidation provide a backup capability. A new computer is to be installed in FY16.
Hoist	The event is loss of the DMO-2 hoist for moving the basket and lid.	L/M	Operation of DMO-2 would be stopped.	Accept	DMO-3 and muffle furnace oxidation provide a backup capability.
DMO-2 limited-volume circulating chilled-water system (LVCCWS) installation	The event is failure to install new LVCCWS on schedule.	L/M	The system is currently operable. The new LVCCWS improves reliability. Failure to install before resumption might affect operations following resumption.	Accept	The LVCCWS is expected to be replaced prior to resumption of ARIES processing.
DMO-3 Operation					
Oxidizer furnace	The event is oxidizer furnace failure due to loss of a major component such as the furnace body, lid, heater elements, basket, auger, auger motor, or basket motor.	M/L	Operation of DMO-3 would be stopped.	Accept	DMO-2 and muffle furnace oxidation provide a backup capability.
Calciner furnace	The event is loss of the DMO-3 calciner furnace, furnace tube, auger, or offload assembly.	M/L	Operation of DMO-3 would be stopped.	Accept	DMO-2 and muffle furnace oxidation provide a backup capability.

Summary of Risk Brainstorm Results for Pu Conversion-DMO (end)					
Title	**Description**	**Rank**	**Consequence**	**Strategy**	**Comments**
Vacuum pump	The event is loss of the DMO-3 vacuum pump, system piping, or control system	M/L	Operation of DMO-3 would be stopped.	Accept	DMO-2 and muffle furnace oxidation provide a backup capability.
Control panel	The event is the loss of the control rack, including the PLC and associated instrumentation.	L/M	Operation of DMO-3 would be stopped.	Accept	DMO-2 and muffle furnace oxidation provide a backup capability.
Hoist	The event is loss of the DMO-3 hoist for moving the basket and lid.	L/M	Operation of DMO-3 would be stopped.	Accept	DMO-2 and muffle furnace oxidation provide a backup capability.
DMO-3 LVCCWS installation	The event is failure to install new LVCCWS on schedule.	M/H	Replacement is a requirement for future DMO-3 operation.	Accept	DMO-3 will not be available for backup to DMO-2 while the LVCCWS is being installed.
Personnel availability	The event is loss of skilled personnel due to aging workforce and loss of people to retirement and lack of retention.	M/M	Loss of people slows production and increases cost. Sufficient personnel are cross-trained such that no single loss will stop production.	Accept	Current staffing is not at a level that allows operation of DMO-2 and DMO-3 concurrently.

[1]Likelihood/Consequence
[2]Ranks are low (L), moderate (M), and high (H).

Summary of Risk Brainstorm Results for Nondestructive Assay (NDA)					
Title	**Description**	**Rank (L/C[1]**	**Consequence**	**Strategy Avoid, Transfer, Mitigate, or Accept**	**Comments**
Twin Bridge calorimeter	The event is failure of the ARIES calorimeter.	M/L[2]	NDA is delayed until the facility NDA calorimetry system can be used.	Accept	The ARIES NDA system is backed up by the Facility NDA lab, use of which may result in delays to NDA results.
Gamma detector	The event is failure of the ARIES gamma-ray isotopic system.	M/L	NDA is delayed. The facility gamma-ray isotopic system procedures may be modified and then the facility NDA system can be used.	Accept	The ARIES NDA system is backed up by the Facility NDA lab, use of which may result in delays to NDA results. The Facility and ARIES NDA facilities are not currently in operation pending approval of criticality operating limits.
Multiplicity counter	The event is failure of the ARIES multiplicity counter.	M/L	NDA is delayed until the facility multiplicity counter can be used.	Accept	The ARIES multiplicity system is backed up by the Facility NDA lab, use of which may result in delays to NDA results. The Facility and ARIES NDA facilities are not currently in operation pending approval of criticality operating limits.

Summary of Risk Brainstorm Results for NDA (end)					
Title	**Description**	**Rank**	**Consequence**	**Strategy**	**Comments**
Gantry robot	The event is failure of the ARIES gantry robot.	L/L	The ARIES NDA system can be operated in manual mode if appropriate ergonomic considerations are addressed.	Accept	The ARIES multiplicity system is backed up by the Facility NDA lab, use of which may result in delays to NDA results. The Facility and ARIES NDA facilities are not currently in operation pending approval of criticality operating limits.
Personnel availability	The event is loss of skilled personnel due to aging workforce and loss of people to retirement and lack of retention.	M/L	Loss of people slows production and increases cost. Sufficient personnel are cross-trained such that no single loss will stop production.	Accept	LANL has a staffing plan, the current staffing level for the NDA team is sufficient, however support functions necessary for movement of material in the event of full facility resumption is uncertain.
Criticality analysis	The event is that criticality analysis and supporting evaluations are not completed for ARIES NDA in time to support resumption of processing.	H/L	Processing of material is not possible without NDA and ARIES NDA is currently paused pending re-evaluation of criticality limits. However, facility NDA is expected to be available.	Accept	Facility NDA services are expected to be available for the initial resumption of ARIES processing. Criticality evaluation for and ARIES NDA is on the schedule but low priority. The date for resumption of NDA activities is uncertain.

[1]Likelihood/Consequence
[2]Ranks are low (L), moderate (M), and high (H).

Summary of Risk Brainstorm Results for Oxide Processing & Characterization					
Title	**Description**	**Rank L/C[1]**	**Consequence**	**Strategy Avoid, Transfer, Mitigate, or Accept**	**Comments**
Surface area analyzer (single-point failure)	The event is failure to install the surface area analyzer before resumption of ARIES production, or a failure of the analyzer after resumption of production.	M/M[2]	Product acceptance would be delayed until surface area analysis is available.	Mitigate	The spare surface area analyzer is to be installed prior to the end of FY16. A backup surface area analyzer should be procured and available. Installation time may be as much as 6 months.
Computer/software	The event is failure of the surface area computer or associated software.	L/L	Product acceptance would be delayed until the computer and software were replaced.	Accept	Backup software and computer are available and the delay in installing is not expected to be significant relative to the rate of oxide production.
Blender	The event is loss of a blender.	L/L	Processing stops without the ability to process the oxide. A backup blender is installed and can be used.	Accept	The blenders are reliable, however in the event that one requires replacement, processing could be delayed.
Rotary sample divider	The event is loss of the rotary sample riffler.	L/L	Processing could continue but analysis would be delayed.	Accept	A spare is available and installation is not expected to take a long time relative to sample analysis.

Summary of Risk Brainstorm Results for Oxide Processing & Characterization (continued)					
Title	**Description**	**Rank**	**Consequence**	**Strategy**	**Comments**
Lab mill	The event is loss of the mill.	L/L	Processing would be delayed until the backup mill could be used.	Accept	A second mill is installed and a spare is available.
Simultaneous thermal analyzer (STA) (single-point failure)	The event is failure of the Netzsch STA.	M/M	There is no installed backup. A spare is available, but typical installation time is approximately 6 months. The consequence is delay in analysis until the equipment is replaced or repaired.	Mitigate	At the current production rate, samples can be accumulated and run in a campaign. This provides a slight mitigation of delays due to equipment failure. However, expedition of the equipment replacement process through pre-planning seems appropriate.
Mass spectrometer (single-point failure)	The event is failure of the Pfeiffer Thermostar Mass Spectrometer, which is approaching its expected lifetime.	M/M	The consequence is delay in analysis until the equipment is replaced or repaired, a spare is available but installation time is uncertain.	Accept	The capability to use a different mass spectrometer would add flexibility.
Heated transfer line (single-point failure)	The event is failure of the heated gas transfer line.	L/M	The consequence is delay in analysis until the equipment can be recalibrated for measurements without the heated transfer line, which would result in added uncertainty to the measurements.	Accept	The heated transfer line has performed reliably, but it is prudent to have a spare.

Summary of Risk Brainstorm Results for Oxide Processing & Characterization (end)					
Title	**Description**	**Rank**	**Consequence**	**Strategy**	**Comments**
Transfer line temperature controller	The event is failure of the gas transfer line temperature Windows XP controller.	M/M	The consequence is delay in analysis until the equipment is replaced or repaired.	Mitigate	The controller runs on Windows XP, which is not supported by LANL. A spare is available, but in the long-term, it needs to be updated to a later Windows version.
Laser diffraction particle size analyzer	The event is failure of the Horiba LA-920 particle size analyzer.	H/M	The consequence is delay in analysis until the equipment is replaced or repaired.	Mitigate	It is likely to fail when processing restarts. A spare is available and could be installed.
Tapped density tester	The event is loss of the tapped density tester.	L/L	A backup is available.	Accept	N/A
Personnel availability	The event is loss of skilled personnel due to aging workforce and loss of people to retirement and lack of retention.	L/L	Loss of people slows production and increases cost.	Accept	LANL has a staffing plan; the current staffing level for the team is sufficient. Sufficient personnel are cross-trained such that no single loss will stop production.
Corrective maintenance	The event is delays in replacement of equipment that fails in service.	L/M	Pu processing or sample analysis is delayed.	Accept	It is not feasible to keep backup equipment in the glovebox line for each piece of equipment. Some pieces of equipment are subject to long administrative delays in replacement.

[1]Likelihood/Consequence
[2]Ranks are low (L), moderate (M), and high (H).

Summary of Risk Brainstorm Results for QA Support					
Title	**Description**	**Rank L/C[1]**	**Consequence**	**Strategy Avoid, Transfer, Mitigate, or Accept**	**Comments**
BLB, CofC, CofA preparation	The event is inability to prepare acceptance documentation per PA-MAP-01004.	M/M[2]	The product acceptance is delayed until the acceptance process and the ARIES production and documentation are made consistent.	Accept	The next group of blend lots will be subjected to the generic acceptance procedure for TA-55 production. The procedure is based on WR production, so it is likely to present problems until it and the ARIES processes are reconciled.
Keep SRNL on institutional evaluated suppliers list (IESL)	The event is inability to keep SRNL on the approved suppliers list.	L/M	The consequences would be a delay in approval of the produced material until approved radiochemical analysis results become available.	Accept	They are currently on the approved suppliers list and the ongoing work to maintain their status is being performed.
ARIES QA	The event is a breakdown in the ARIES QA Program.	L/M	The inability to approve products for shipment.	Accept	Annual external audits and customer audits are already part of the ARIES QA system.

[1]Likelihood/Consequence
[2]Ranks are low (L), moderate (M), and high (H).

Summary of Risk Brainstorm Results for Engineering Support					
Title	**Description**	**Rank L/C[1]**	**Consequence**	**Strategy Avoid, Transfer, Mitigate, or Accept**	**Comments**
LVCCWS upgrade for DMO-2	Inability to support installation.	L/L[2]	Delay in installation.	Accept	See similar item for DMO-3, Pu Conversion. Design and cold testing are complete.
LVCCWS upgrade for DMO-3	Inability to support installation.	L/L	Delay in installation.	Accept	See similar item for DMO-2, Pu Conversion. Design and cold testing are complete.
DMO-3 control system upgrade	The event is a delay in the DMO-3 control system upgrade.	L/L	The DMO-3 will be out of service while the revised control system is installed and tested.	Accept	The control system upgrade allows automatic operation, but the system is available for manual operation without the upgrade.
Pit cutter installation	Inability to support installation and testing results in a delay in the installation of the pit cutter.	L/L	Pit disassembly continues to be vulnerable to single-point failure of the robotic lathe.	Accept	On track for FY18 installation. Pit cutter has been built and tested and is ready when the glovebox is ready.
Muffle furnace control system upgrade	Delay in installation and testing of the new muffle furnace control system.	L/L	The installation of the control system will improve muffle furnace reliability.	Accept	The Process Automation and Control Group's (AET-5) portion of development is essentially finished.
Conveyor side eject system	The event is inoperability of the conveyor side eject system.	H/L	The inoperability of the side eject system causes a loss of efficient operation, but operations may continue.	Mitigate	AET-5 is developing options for improvement of the system reliability.

Summary of Risk Brainstorm Results for Engineering Support (end)					
Title	**Description**	**Rank**	**Consequence**	**Strategy**	**Comments**
Corrective maintenance support	The event is unavailability of AET-5 support for program equipment maintenance.	L/L	Corrective maintenance results in longer outage times.	Accept	The risk is accepted based on the assumption that staffing and budgets remain consistent with current levels.
Configuration management	The event is failure to produce or maintain the program equipment technical baseline.	M/L	Equipment outages are extended.	Mitigate	Development of the technical baseline for program equipment is a significant long-term objective.
Spare parts	The event is lack of spare parts.	L/M	The lack of spares results in longer than necessary equipment outages.	Mitigate	The development of spare parts schedules and storage is a significant long-term objective.
GB water ingress	The event is revised Criticality analysis requiring the effects of water ingress due to fire suppression	H/M	The possibility of water ingress results in more severe criticality limits	Mitigate	Modify gloveboxes to limit the amount of fire suppression water that can enter the GB.

[1]Likelihood/Consequence
[2]Ranks are low (L), moderate (M), and high (H).

Summary of Risk Brainstorm Results for Program Management					
Title	**Description**	**Rank L/C[1]**	**Consequence**	**Strategy Avoid, Transfer, Mitigate, or Accept**	**Comments**
Change to production rate	The event is a request to increase production rate.	H/M[2]	TBD	Accept	It is likely that toward the end of the next 5 years the requested production rate will change.
Change to interface control document (ICD) requirements	The opportunity is a reduction in ICD requirements.	H/L	Reduction in cost.	Accept	Small improvement on production rate, but a cost-savings.
Warehousing and procurement	The event is removal of special program requirements for procurement and reverting to standard LANL quality programs.	L/L	Cost savings.	Accept	N/A
Mission change					
Mission change to oxide requirements	The event is a change in the mission that changes oxide requirements.	H/M	TBD	Accept	It is likely that the mission will change within the next 5 years.
Change to the downblend mission	The event is a change from the processing of Pu for MOX to the processing of Pu for downblending.	H/M	TBD	Accept	The basic steps of processing are not likely to change, but the requirements for each step will likely change.

Summary of Risk Brainstorm Results for Program Management (continued)					
Title	**Description**	**Rank**	**Consequence**	**Strategy**	**Comments**
Storage					
3013 storage in vault	The event is loss of designated storage in the vault.	L/H	Production stops.	Accept	Reserved storage is sufficient for anticipated production rates. If other programs take the storage, production could be affected.
Inline storage	The event is loss of inline storage.	H/M	Slower production rate.	Mitigate	Inline storage is more difficult due to new criticality limits. Relaxation of limits through more analysis is possible over the period of performance.
Safes	The event is the addition of safes for storage.	M/M	Additional safes stabilize the beginning and end of processing.	Mitigate	Additional safes and seismic anchoring of safes are currently being implemented.
Seismic upgrades for safes	The event is failure to seismically anchor safes.	L/M	The loss of storage space affects the beginning and end of processing and can slow production.	Mitigate	Safes are being seismically anchored.
Funding uncertainty	The event is a continuing resolution at the beginning of FY17.	H/M	Drop in authorized budget until a final budget is approved.	Accept	N/A
Readiness assessments	The event is readiness assessments— impose restrictions or delay a module in restarting.	L/L	Delays in startup of new or modified equipment.	Accept	N/A

Summary of Risk Brainstorm Results for Program Management (continued)					
Title	**Description**	**Rank**	**Consequence**	**Strategy**	**Comments**
Changes to PF-4 accessibility	The event is room construction that makes access to an ARIES module unavailable.	M/M	Delays in processing.	Accept	N/A
PF-4 pause in operation	The event is an operational pause.	M/M	Pause in operation.	Accept	The pause due to criticality has been long but unusual. Short pauses are more likely but have a smaller effect on production.
Regulatory requirements changes					
LANL contract changes	The event is the LANL contract change in 2018.	H/M	Reduced productivity.	Accept	Contract changes often affect personnel.
Safety analysis report for packaging (SARP) changes for 9975/9977	The event is a change in shipping container requirements.	L/M	Changes could affect shipments.	Accept	Requirements are well established and changes are not expected to be significant.
Changes to allowable exposure to radiation	The event is a reduction in allowed doses.	M/M	Production productivity.	Accept	N/A
Changes to waste management requirements	The event is an increase in program costs due to changes in how waste management is funded.	M/M	Increased cost.	Accept	N/A

Summary of Risk Brainstorm Results for Program Management (continued)					
Title	**Description**	**Rank**	**Consequence**	**Strategy**	**Comments**
Production planning and control					
Electronic data sheets	Opportunity is to reduce acceptance issues.	M/L	Reduction in product acceptance costs.	Accept	N/A
Facility Organizational programs					
Conduct of engineering, maintenance, operation, training, etc.	The event is changes in "conduct of" policies requiring changes to procedures.	M/L	Delays in conduct of processing or installation of equipment.	Accept	Policy changes are not unusual and the consequences are normally accounted for in the routine planning. A significant change might affect schedule.
Material control and accountability (MC&A)	The event is that MC&A requirements affect processes.	L/L	Requires a change in normal material accountability.	Accept	This program is well-established and has been a part of processing since the beginning.
MC&A	The opportunity is increase in flexibility for use of material.	M/M	Opportunity to blend Pu oxide from various sources, will reduce risk and improve productivity.	Mitigate	Allowing muffle furnace and DMO oxide to be mixed provides operational flexibility.

Summary of Risk Brainstorm Results for Program Management (end)					
Title	**Description**	**Rank**	**Consequence**	**Strategy**	**Comments**
Criticality safety					
New criticality limits	The event is that new criticality limits reduce production rate.	H/L	Reduction in processing.	Accept	Resumption of operation will help clarify this risk/opportunity.
New criticality analyses	The opportunity is that criticality analyses allow processing with more flexible limits.	M/M	Recovery of some of the operational restrictions due to changes in criticality requirements.	Mitigate	N/A
New or Revised CSEDs	Resources are not available for revising CSEDs	H/M	The inability to complete revised CSEDs even when revised criticality analyses are complete delays the relaxation of severe criticality restrictions	Accept	Operation will continue under the current limits.

[1]Likelihood/Consequence
[2]Ranks are low (L), moderate (M), and high (H).

Summary of Risk Brainstorm Results for Pu Conversion Muffle Furnace					
Title	**Description**	**Rank L/C[1]**	**Consequence**	**Strategy Avoid, Transfer, Mitigate, or Accept**	**Comments**
Carbolite furnace	The event is the failure of a Carbolite furnace.	M/L[2]	The rate of oxide production would be reduced.	Accept	There are 3 Carbolite furnaces available for ARIES production. Spare furnaces and spare parts are available.
Dual furnace control system[3]	The event is failure of the dual furnace controller.	M/M	Failure of the controller may result in loss of two furnaces.	Accept	There are 3 Carbolite furnaces available for ARIES production. The dual control system is legacy and provides control function for two furnaces.
Single furnace control system[3]	The event is failure of the single furnace controller.	L/L	This event would affect one of the muffle furnaces.	Accept	There are 3 Carbolite furnaces available for ARIES production.
MR&R shared furnace	The event is the requirement for one of the ARIES muffle furnaces for another mission.	L/L	The rate of oxide production could be reduced.	Accept	If the muffle furnace assigned to MR&R failed or the MR&R mission expanded to need one of the ARIES furnaces, the capacity of the remaining two furnaces would be sufficient for current production rate.

Summary of Risk Brainstorm Results for Pu conversion Muffle Furnace (end)					
Title	**Description**	**Rank**	**Consequence**	**Strategy**	**Comments**
Control system upgrade	The event is that the control system upgrade is not completed as scheduled.	L/L	The current control system is operable but out of date. A short delay in outyear production might occur if it is installed after resumption of operations.	Accept	The upgrade is scheduled for FY16 before resumption of production.
Size reduction	The event is that input material does not allow full furnace capacity.	H/L	Reduced production rate, and size reduction uses crude methods.	Mitigate	Current production rates can be supported without size reduction.

[1]Likelihood/Consequence
[2]Ranks are low (L), moderate (M), and high (H).
[3]These are due to be upgraded to a combined control system in FY16.

Appendix 2, Individual Risk/Opportunity Evaluations

ARIES Risk/Opportunity Identification Forms Packaging

ID Number: P-1	Revision: 0	Last Evaluated: initial	Status: Watch list
Event Title: COGEMA Crimper (single-point failure)			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 3/22/16	
Processes Affected: Packaging			

Initial Evaluation

Statement of Event: This motor-driven crimper has been in service for over 10 years. The event is failure of the crimper such that successful crimping of the convenience can becomes uncertain or impossible.

Likelihood:	Moderate	**Likelihood Basis:** The crimper has operated reliably for 10 years but is also aging.
Consequence:	High	**Consequence Basis:** Packaging ceases until (1) a replacement or repaired crimper is available (2) permission is received to have poorly crimped COGEMA containers.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: Obtain a back-up crimper
Implementation Cost:	Low	Basis for Cost: The backup crimper is customer furnished, so costs are minimal.
Implementation Schedule:	Unknown	Basis for Schedule: The backup crimper has been on order for 4 years.

Residual Risk Evaluation

Statement of Residual Event:

The backup crimper is on order. After the backup crimper is received, the consequence of crimper failure will mainly be related to the time for installation of the backup crimper or for revision of crimping procedures. At the current production rate, these delays are considered as moderate. The general reliability of the crimper, based on past performance, is good, but the crimper is aging, so the likelihood of crimper failure is moderate.

Residual Likelihood:	Moderate	Residual Likelihood Basis: Having a backup crimper does not affect likelihood of crimper failure.
Residual Consequence:	Low	Residual Consequence Basis: After the backup is available, the primary consequence is the delay associated with installation. At the current production rate, this is considered as low consequence.
Residual Risk Level:		

Additional Comments and Status

Comments: These crimpers are provided from COGEMA through MOX Services. A backup crimper has been on order for over 4 years. The LANL convenience can crimper is installed, but the use of the LANL convenience can is not approved for this program. The LANL can crimper could possibly be used as an emergency backup.

ARIES Risk/Opportunity Identification Form Packaging

ID Number: P-2	Revision: 0	Last Evaluated: initial	Status: Inactive
Event Title: COGEMA Convenience Can Availability			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 3/22/16	
Processes Affected: Packaging			

Initial Evaluation

Statement of Event:
The event is the loss of the ability to use the COGEMA convenience can due to depletion of the available inventory or a change in packaging requirements.

Likelihood:	L	Likelihood Basis: The current inventory of approximately 380 cans is sufficient for the next 5 years at the current production rate.
Consequence:	H	Consequence Basis: Packaging ceases until a substitute convenience can is procured along with new crimper and procedures.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: It is very unlikely that MOX would change the type of convenience can.
Implementation Cost:	Unknown	Basis for Cost: If a change allowing the use of the LANL convenience can were made, cost would be minimum. If the change is to an entirely different can, then the cost is unknown.
Implementation Schedule:	N/A	Basis for Schedule: The current risk is accepted.

Residual Risk Evaluation

Statement of Residual Event: The risk remains moderate due to the consequence.

Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	H	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: The current inventory is approximately 380 cans. These were furnished by MOX Services. At the current rate, these are expected to be sufficient for the next 5 years. Additional cans are not expected to be available. If more are needed, they would need to be procured from another source.

ARIES Risk/Opportunity Identification Form Packaging

ID Number: P-3	Revision: 0	Last Evaluated: initial	Status: Inactive
Event Title: Inner Can (IC) Welder			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 3/22/16	
Processes Affected: Packaging			

Initial Evaluation

Statement of Event: The event is the loss of the ability to weld ICs using the IC welder.		
Likelihood:	L	Likelihood Basis: The new IC welder was installed in 2015; the RIPS welder provides redundancy.
Consequence:	M	Consequence Basis: Packaging ceases without the ability to perform IC welding. There are two welders available for welding the IC. The consequence of losing the primary IC welder is that the RIPS welder would become the primary IC welder.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: Continue operations and maintenance of the new IC welder and RIPS. Maintain the spare welder in the cold lab for weld development.
Implementation Cost:	N/A	Basis for Cost: These costs are in the current funding, which is assumed to continue.
Implementation Schedule:	N/A	Basis for Schedule:

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	M	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: The new IC welder was installed in 2015 and is backed up by the RIPS IC welder. A spare welder is used in the cold lab for weld development and training. The spare welder is also available for spare parts.

ARIES Risk/Opportunity Identification Form Packaging

ID Number: P-4	Revision: 0	Last Evaluated: initial	Status: Inactive
Event Title: Inner Can (IC) Availability			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 3/22/16	
Processes Affected: Packaging			

Initial Evaluation

Statement of Event:
Depletion of inventory of ICs and lids.

Likelihood:	L	Likelihood Basis: The new likelihood is low due to the current inventory of ICs.
Consequence:	H	Consequence Basis: Packaging ceases.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The inventory of ICs is sufficient to render the risk acceptable.
Implementation Cost:	N/A	Basis for Cost: These cans are currently in storage and available for use.
Implementation Schedule:	N/A	Basis for Schedule:

Residual Risk Evaluation

Statement of Residual Event:
The residual risk remains moderate due to the consequences.

Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	H	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments:
LANL currently has approximately 450 ICs in storage. At the current rate, these are expected to be sufficient for the next 5 years.

ARIES Risk/Opportunity Identification Form Packaging

ID Number: P-5	Revision: 0	Last Evaluated: initial	Status: Inactive
Event Title: Leak Testing the IC			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 3/22/16	
Processes Affected: Packaging			

Initial Evaluation

Statement of Event:
The event is inability to perform leak testing per the packaging time limit requirements for the hot leak test after IC welding.

Likelihood:	L	Likelihood Basis: Based on previous experience, the likelihood is low.
Consequence:	M	Consequence Basis: Failure to meet packaging requirements
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The primary risk is associated with the ability to meet time limits for performance of the leak test. It is driven by the separation of the hot leak test from the IC welding operation.
Implementation Cost:	N/A	Basis for Cost: N/A
Implementation Schedule:	N/A	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains low. Delays due to movement are outside the control of the program.

Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	M	Residual Consequence Basis: Failure to meet the time limit may result in a nonconformance or a re-work of the IC.
Residual Risk Level:		

Additional Comments and Status

Comments: The leak test station is located in a different room than the ICW. Delay in transfers to the hot leak station can occur. There are 4 leak detectors available for use, but the trolley and room availability drive the risk.

ARIES Risk/Opportunity Identification Form Packaging

ID Number: P-6	Revision: 0	Last Evaluated: initial	Status: Inactive
Event Title: Leak Test Equipment Failure			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 3/22/16	
Processes Affected: Packaging			

Initial Evaluation

Statement of Event: The event is failure of the leak test chamber or attached helium leak detector.		
Likelihood:	L	Likelihood Basis: The leak test chamber is a passive component, there are multiple leak detectors.
Consequence:	M	Consequence Basis: Failure to meet packaging requirements.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The primary risk is associated with the ability to meet time limits for performance of the leak test.
Implementation Cost:	N/A	Basis for Cost: N/A
Implementation Schedule:	N/A	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains low.		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	M	Residual Consequence Basis: Failure to perform the hot leak station may result in a nonconformance or a rework of the IC. Loss of the leak test chamber could provide a prolonged delay in processing.
Residual Risk Level:		

Additional Comments and Status

Comments: The leak test chamber is a passive unit with a replaceable gasket. There are 4 leak detectors available for use.

ARIES Risk/Opportunity Identification Form Packaging

ID Number: P-7	Revision: 0	Last Evaluated: initial	Status: Inactive
Event Title: Electro-Decontamination System (EDS) Equipment Failure			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 3/22/16	
Processes Affected: Packaging			

Initial Evaluation

Statement of Event: The event is EDS failure (mechanically or control system).		
Likelihood:	M	Likelihood Basis: The EDS is relatively complicated but loss of EDS capability is judged moderate because of the backup system provided by RIPS.
Consequence:	M	Consequence Basis: Packaging ceases due to loss of the ability to decontaminate the IC.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: Staffing and maintenance for the RIPS provides backup.
Implementation Cost:	N/A	Basis for Cost: Staffing and maintenance of the primary EDS and backup RIPS is part of current funding.
Implementation Schedule:	N/A	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains low.		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	M	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: The primary EDS is original to ARIES startup (pre-1998) although it has had controller upgrades (2015) and mechanical maintenance. RIPS provides a backup EDS capability. Mechanical portions (valves, pumps, gauges, etc.) are maintained, but are used until failure.

ARIES Risk/Opportunity Identification Form Packaging

ID Number: P-8	Revision: 0	Last Evaluated: initial	Status: Inactive
Event Title: Outer Can Welder (single-point failure)			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 3/22/16	
Processes Affected: Packaging			

Initial Evaluation

Statement of Event: The event is failure of the OCW control system or mechanical system.		
Likelihood:	L	Likelihood Basis: The new OC welder was installed in 2015.
Consequence:	H	Consequence Basis: Packaging ceases without the ability to perform outer can welding.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description:
Implementation Cost:	N/A	Basis for Cost: N/A
Implementation Schedule:	N/A	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	L	Residual Likelihood Basis: LANL has spare parts and access to the OCW for repairs.
Residual Consequence:	H	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: LANL has spare parts and can fix the OCW.

ARIES Risk/Opportunity Identification Form Packaging

ID Number: P-9	Revision: 0	Last Evaluated: initial	Status: Inactive
Event Title: Outer Can Availability			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 3/22/16	
Processes Affected: Packaging			

Initial Evaluation

Statement of Event: The event is depletion of the inventory of outer cans and lids.		
Likelihood:	L	Likelihood Basis: The new likelihood is low due to the current inventory of outer cans.
Consequence:	H	Consequence Basis: Packaging ceases.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: LANL currently has approximately 520 outer cans in storage. At the current rate, these are expected to be sufficient for the next 5 years.
Implementation Cost:	N/A	Basis for Cost: These cans are currently in storage and available for use.
Implementation Schedule:	N/A	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains moderate due to the consequences.		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	H	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: LANL currently has approximately 520 outer cans in storage. At the current rate, these are expected to be sufficient for the next 5 years. The inventory of OCs is sufficient to render the risk acceptable for packaging ARIES material.

ARIES Risk/Opportunity Identification Form Packaging

ID Number: P-10 see PM-29	Revision: 1	Last Evaluated: 2/22/17	Status: Closed per PM-29
Event Title: Personnel Availability			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 3/22/16	
Processes Affected: Packaging			

Initial Evaluation

Statement of Event: The event is loss of skilled personnel due to aging workforce and loss of people to retirement and lack of retention.

Likelihood:	M	Likelihood Basis: Some personnel turnover is expected during the next 5 years.
Consequence:	L	Consequence Basis: Loss of people slows production and increases cost. Sufficient personnel are cross-trained such that no single loss will stop production.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The risk is acceptable based on execution of the current staffing plan.
Implementation Cost:	N/A	Basis for Cost: Current funding supports maintaining the workforce.
Implementation Schedule:	N/A	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event:

Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: This risk has been combined into PM-29 which addresses personnel risk for the program

ARIES Risk/Opportunity Identification Form Packaging

ID Number: P-11 see PM-29	Revision: 1	Last Evaluated: 2/22/17	Status: Closed per PM-29
Event Title: Certified Personnel Availability			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 3/22/16	
Processes Affected: Packaging			

Initial Evaluation

Statement of Event: The event is loss of certified welders, leak testers and visual inspectors.		
Likelihood:	L	Likelihood Basis: The program has multiple certified personnel, but not enough for accelerated production
Consequence:	M	Consequence Basis: Packaging ceases without certification until recertified personnel become available.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: See PM-29. In the short term, the risk is moderated for the packaging team by current availability of certified workers, the low production rate and the ongoing LANL program for maintaining certifications.
Implementation Cost:	N/A	Basis for Cost: Current funding supports maintaining the workforce.
Implementation Schedule:	N/A	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	L	Residual Likelihood Basis: LANL certification programs remain in place for recertification and certification of additional personnel.
Residual Consequence:	M	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: This risk has been combined into PM-29 which addresses personnel risk for the

ARIES Risk/Opportunity Identification Forms Pit Disassembly

ID Number: PD-1	Revision: 1	Last Evaluated: 2/22/17	Status: Watch list
Event Title: Robotic Lathe			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 5/31/16	
Processes Affected: PITD			

Initial Evaluation

Statement of Event: The event is failure of the robotic lathe.		
Likelihood:	L	Likelihood Basis: The lathe has been in service since 2009, but the control system was recently upgraded. However, other components are subject to age related failure.
Consequence:	H	Consequence Basis: PITD stops until the lathe is returned to service.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: The installation of the pit cutter will provide an alternate method of PITD for most pits. The installation of the 2nd lathe in the cold lab also provides a source of spare parts.
Implementation Cost:	$3.6 M FY-17	Basis for Cost: $600K for cold lab installation in FY17. $3M in FY-17 and $1.5M in FY 18 for the pit cutter. Pit cutter glovebox fabrication is in the current budget and it is expected that installation will continue to be funded.
Implementation Schedule:	0	Basis for Schedule: Pit cutter is scheduled for installation in 2018.

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains moderate due to the consequences.		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	M	Residual Consequence Basis: It is unlikely that a robotic lathe failure will stop PITD after installation of the pit cutter.
Residual Risk Level:		

Additional Comments and Status

Comments: The pit cutter will provide an alternate capability for this module when it is installed in 2018.

ARIES Risk/Opportunity Identification Form Pit Disassembly

ID Number: PD-2	Revision: 1	Last Evaluated: 2/22/17	Status: Inactive
Event Title: Robotic Lathe Software			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 5/31/16	
Processes Affected: PITD			

Initial Evaluation

Statement of Event: The event is failure of the robotic lathe software.		
Likelihood:	L	**Likelihood Basis:** The lathe software was upgraded in 2015. A failure of the software would stop operation of the PITD module. Software problems are judged to be slightly higher during the initial use period in 2016–2017.
Consequence:	M	Consequence Basis: Backup software is available, so the delay in operation would be limited.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: After the installation of the pit cutter, the consequences of robotic lathe software failure will be even less.
Implementation Cost:	N/A	Basis for Cost: N/A
Implementation Schedule:	N/A	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains moderate due to the consequences.		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	M	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: The software on the current lathe was upgraded in 2015. A backup version of the software is stored online but needs to be placed in the TA-55 software inventory.

ARIES Risk/Opportunity Identification Form Pit Disassembly

ID Number: PD-3	Revision: 1	Last Evaluated: 2/22/17	Status: Generic Watch list
Event Title: Robotic Lathe Spare Parts			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 5/31/16	
Processes Affected: PITD			

Initial Evaluation

Statement of Event: The event is system downtime because maintenance or repair cannot be achieved due to lack of spare parts.		
Likelihood:	L	Likelihood Basis: The spare parts inventory during the past 8 years of operation has been sufficient to keep the lathe in operation.
Consequence:	M	Consequence Basis: The consequences are judged to be moderate based on the production rate and expectation that an outage due to lack of spare parts will not be long-term.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: An inventory of spare parts is being maintained. The installation of a second robotic lathe in the cold lab will enhance the availability of long lead time expensive spare parts.
Implementation Cost:	N/A	Basis for Cost: FY 17 funding level, $600K
Implementation Schedule:	N/A	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains low due to past performance, the inventory of spare, the low production rate, and the expected installation of a similar system in the cold lab.		
Residual Likelihood:	L	**Residual Likelihood Basis:** Unchanged
Residual Consequence:	M	**Residual Consequence Basis:** Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments:. The spare parts inventory during the past 8 years of operation has been sufficient to keep the lathe in operation.

ARIES Risk/Opportunity Identification Form Pit Disassembly

ID Number: PD-4	Revision: 1	Last Evaluated: 2/22/17	Status: Watch list
Event Title: Robotic Lathe Staging Area			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 5/31/16	
Processes Affected: PITD			

Initial Evaluation

Statement of Event: The event is lack of storage space, which causes processing to stop.		
Likelihood:	H	Likelihood Basis: It is not uncommon to stop operation due to lack of storage for the products. Likelihood depends on conveyor and trolley operability and/or accessible in line storage locations.
Consequence:	L	Consequence Basis: The effect on overall production is considered low because when storage is full, items are available for downstream processing.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: Once storage space is filled, the module production rate is limited to the throughput of the next operation. Downstream operations have resumed. Mitigation is through investment into in-line storage and bagout capability.
Implementation Cost:	N/A	Basis for Cost: N/A
Implementation Schedule:	N/A	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains moderate.		
Residual Likelihood:	H	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: Currently storage space is full. This item is part of an overall watch list risk item for storage and movement of material through the plant.

ARIES Risk/Opportunity Identification Form Pit Disassembly

ID Number: PD-5 see E-6	Revision: 1	Last Evaluated: 2/22/17	Status: Close see E-6 and comments
Event Title: Material Transfer			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 5/31/16	
Processes Affected: PITD			

Initial Evaluation

Statement of Event: The event is the unavailability of the elevator, trolley, or conveyor to move items.		
Likelihood:	M	Likelihood Basis: Past experience indicates that the systems for movement of the pits to PITD are not always available.
Consequence:	L	Consequence Basis: The effect on overall production is considered low because manual movement can usually compensate. The consequences will increase with increased production.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: Improvements to the conveyor are funded in FY 17. Storage issues are addressed with other risks. Trolley and elevator, operation impacts many programs and is a facility operations issue.
Implementation Cost:	$900K, FY17	Basis for Cost: FY 17 planned cost is $900K with additional costs expected in FY18.
Implementation Schedule:	N/A	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains moderate.		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: Material is transferred to and from this module using the elevator, trolley, and conveyor systems. They are not always available. SNM storage space provides some buffer to downstream operations during delays due to outages of material transfer systems. This item is part of a overall watch list risk item for storage and movement of material through the plant. The Conveyor is addressed by E-6.

ARIES Risk/Opportunity Identification Form Pit Disassembly

ID Number: PD-6 see PM-29	Revision: 1	Last Evaluated: 2/22/17	Status: closed per PM-29
Event Title: Staffing for PITD			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 5/31/16	
Processes Affected: PITD			

Initial Evaluation

Statement of Event: The event is the loss of qualified persons to maintain and operate the system.		
Likelihood:	H	Likelihood Basis: The module process engineer will retire in 2017. Two experienced technicians have already retired.
Consequence:	M	Consequence Basis: The effect on overall production is considered moderate; a designated replacement is being trained. System operation requires qualified personnel and technical support. The PrE is responsible for the engineering basis of the module and is essential to long-term continued operation of the function. Trained technicians are necessary for unit operations. Machinist demand may exceed availability in FY 18.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: Provide a replacement
Implementation Cost:	N/A	Basis for Cost: N/A
Implementation Schedule:	N/A	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk likelihood remains moderate.		
Residual Likelihood:	L	Residual Likelihood Basis: Training the replacement is on-going. NCO is funded to hire three replacement techs.
Residual Consequence:	M	Residual Consequence Basis: The initial use of new personnel is not expected to have production consequences, but the added costs of newly hired personnel who are waiting for training, certification and security clearances must be addressed..
Residual Risk Level:		

Additional Comments and Status

Comments: This risk has been combined into PM-29 which addresses personnel risk for the program. A replacement PrE has been designated. Lathe and equipment operators must be maintained and qualified as GB workers and FMHs. Technicians are in formal training programs to maintain GB worker and FMH qualification. The new lathe in the cold lab will be used to maintain training on the operation of the equipment.

ARIES Risk/Opportunity Identification Forms Shipping & Receiving

ID Number: S-1	Revision: 1	Last Evaluated: 2/22/17	Status: Watch list
Event Title: Pit Storage			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/2/16	
Processes Affected: Shipping and Receiving			

Initial Evaluation

Statement of Event: The event is insufficient space for storage of pits arriving for ARIES processing, or product waiting to be shipped.		
Likelihood:	M	Likelihood Basis: The program owns safes and storage space. However uncertainties about the ability to ship, competition for space from other programs and uncertainties about usage due to revised criticality concerns all combine to make the likelihood of insufficient storage a moderate concern.
Consequence:	M	Consequence Basis: The effect is that more shipments with fewer parts are necessary. Production dependence on shipment scheduling will increase cost and reduce efficiency.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: Shipment of waste is outside of the program's control. The effects of storage on production will be watched. If production rates are affected by this issue, options including procurement of more safes, can be implemented.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains moderate. It will require more resources for scheduling and coordination of shipments.		
Residual Likelihood:	M	Residual Likelihood Basis: It is likely that the effects of limited storage will affect production initially, during the next 5 years, but gradually diminish as shipments resume.
Residual Consequence:	M	Residual Consequence Basis**:** It is likely to affect some production rates, but not likely to prevent achievement of the expected production.
Residual Risk Level:		

Additional Comments and Status

Comments: The limited storage will likely require more shipments of fewer items. This item is part of an overall watch list risk item for storage and movement of material through the plant.

ARIES Risk/Opportunity Identification Form Shipping & Receiving

ID Number: S-2	Revision: 1	Last Evaluated: 2/22/17	Status: Active
Event Title: Upgrade to Receive MD-2 Type Containers			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/2/16	
Processes Affected: Shipping and Receiving			

Initial Evaluation

Statement of Event: The event is a delay in the upgrades to allow for use of the MD-2 type containers.		
Likelihood:	M	Likelihood Basis: The upgrade design is on schedule for FY16 with installation in FY17. Achievement of the schedule for implementation is judged to be 50/50.
Consequence:	L	Consequence Basis: The current model FL container may continue to be used until the modifications are installed, therefore the consequences of a delay on the production rate is judged to be low. The MD-2 can be used without the modification, but at a very low rate.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: The modifications are continuing to be worked. Installation of necessary modifications will be completed when funding is available.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains low. Delay in implementation of the modification will require more resources for scheduling and coordination of shipments.		
Residual Likelihood:	M	Residual Likelihood Basis: A delay in the modification schedule is possible.
Residual Consequence:	L	Residual Consequence Basis: The current container may continue to be used if there is a delay in the upgrade, and the MD-2 may be used at a very low rate.
Residual Risk Level:		

Additional Comments and Status

Comments: The upgrade is already in the planned activities.

ARIES Risk/Opportunity Identification Form Shipping & Receiving

ID Number: S-3	Revision: 1	Last Evaluated: 2/22/17	Status: Watch list
Event Title: Availability of 9975 Containers			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/2/16	
Processes Affected: Shipping and Receiving			

Initial Evaluation

Statement of Event: The event is depletion of the 9975 containers.		
Likelihood:	H	Likelihood Basis: The number of 9975s will be expended within 5 years at the expected capability maintenance production rate.
Consequence:	M	Consequence Basis: Shipments stop until containers become available. This consequence is considered moderate because the containers are expected to be routinely available.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: Monitor the usage and procure additional 9975 shipping containers when needed, based on projected production and procurement lead time. This item is placed on the watch list and mitigated by procurement of shipping containers at the appropriate time.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk is judged to be easily managed because procurement of 9975s is not considered difficult.		
Residual Likelihood:	M	Residual Likelihood Basis: Residual risk is considered moderate due to the need to monitor usage and uncertainty about procurement lead times.
Residual Consequence:	L	Residual Consequence Basis: If procured in time, the risk is low that the processing will be affected due to a lack of shipping containers
Residual Risk Level:		

Additional Comments and Status

Comments: The upgrade to 9977s is already in the planned activities. Procurement of additional 9975s is not problematic.

ARIES Risk/Opportunity Identification Form Shipping & Receiving

ID Number: S-4	Revision: 1	Last Evaluated: 2/22/17	Status: Inactive
Event Title: Use of 9977 Shipping Containers			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/2/16	
Processes Affected: Shipping and Receiving			

Initial Evaluation

Statement of Event: The event is the loss of the opportunity to use 9977 shipping containers.		
Likelihood:	L	Likelihood Basis: The event is inability to use 9977 shipping containers. SRS safety basis requires revision to allow storage in 9977s. Their acceptance is expected.
Consequence:	L	Consequence Basis: Shipping and storage are more efficient since the 9977 may hold two containers.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The use of the 9977s is mainly controlled by the SRS ability to accept them.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The risk is considered low. If SRS cannot receive and store 9977s, more resources for scheduling and coordination of shipments may be necessary.		
Residual Likelihood:	L	Residual Likelihood Basis: There is little risk in waiting to assess 9975 usage before procuring additional shipping containers.
Residual Consequence:	L	Residual Consequence Basis: There is little risk in waiting to assess 9975 usage before procuring additional shipping containers.
Residual Risk Level:		

Additional Comments and Status

Comments: The use of the 9977 represents an improvement in efficiency, but its approval is mainly out of the program's control.

ARIES Risk/Opportunity Identification Form Shipping & Receiving

ID Number: S-5	Revision: 1	Last Evaluated: 2/22/17	Status: Inactive
Event Title: FS 65 Storage Surveillance			
Type (Risk/Opp): Opp	Contact: Process Engineer	Date Identified: 6/2/16	
Processes Affected: Shipping and Receiving			

Initial Evaluation

Statement of Event: The opportunity is disposal of the un-irradiated fuel elements in the FS-65 storage container, taking up space in PF-4.		
Likelihood:	L	Likelihood Basis: No identified path forward, options are being considered by NA-23. Funding for disposition is not likely unless it becomes a safety issue.
Consequence:	L	Consequence Basis: Reduce the cost of continued surveillance and gain storage space occupied by the FS-65.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Transfer	Description: NA-23 is considering options.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: No identified path forward, options are being considered by NA-23.

ARIES Risk/Opportunity Identification Form Shipping & Receiving

ID Number: S-6 see PM-29	Revision: 1	Last Evaluated: 2/22/17	Status: Closed per PM-29
Event Title: Personnel Availability			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/2/16	
Processes Affected: Shipping and Receiving			

Initial Evaluation

Statement of Event: The event is loss of qualified packaging and shipping personnel.		
Likelihood:	M	Likelihood Basis: It is likely that personnel changes will occur over the next 5 years.
Consequence:	L	Consequence Basis: Delays in shipping are possible, although not likely due to the ability to draw on authorized shippers and packaging engineers from other programs while replacement personnel are identified and trained.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The current staffing level is assumed to remain constant over the next 5 years.
Implementation Cost:	0	Basis for Cost: The current budget is expected to remain constant over the next 5 years.
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk is expected to remain the same over the next 5 years.		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: This risk has been combined into PM-29 which addresses personnel risk for the program. A backup packaging engineer is being trained. Authorized shippers and packaging engineers are available from other teams. Fissile material handlers and leak testers are available from the facility.

ARIES Risk/Opportunity Identification Forms Pu Conversion DMO

ID Number: D-1	Revision: 1	Last Evaluated: 2/22/17	Status: Inactive
Event Title: DMO-2 Oxidizer Furnace Failure			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 5/19/16	
Processes Affected: Pu Conversion			

Initial Evaluation

Statement of Event: The event is oxidizer furnace failure due to loss of a major component such as the furnace body, lid, heater elements, basket, auger, auger motor, or basket motor.		
Likelihood:	M	Likelihood Basis: Components such as heater elements, augers, motors, and baskets have recently been replaced and are likely to require replacement again within the next 5 years. Passive components such as the furnace body or lid are more reliable and might also require replacement; however, their loss would likely result in an indefinite loss of the furnace. Some warpage in the oxidizer body has been observed.
Consequence:	L	Consequence Basis: Spare parts and availability of alternate Pu-conversion capability by DMO-3 in FY-18, and/or muffle furnaces, combine to make the consequences low at the capability maintenance level of production. The consequences are more severe at the increased production rates associated with the Dilute and Dispose option.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: If funding is available, begin design for new furnace replacement. This will shorten replacement time if major passive components fail.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: Spare parts and alternate Pu-conversion capability are acceptable at the current production levels.		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: LANL has spare parts and can continue Pu Conversion while DMO-2 maintenance or repair is conducted.

ARIES Risk/Opportunity Identification Form Pu Conversion DMO

ID Number: D-2	Revision: 1	Last Evaluated: 2/22/17	Status: Active
Event Title: DMO-2 Calciner Furnace Failure			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 5/19/16	
Processes Affected: Pu Conversion			

Initial Evaluation

Statement of Event: The event is loss of the DMO-2 calciner furnace, furnace tube, auger, offload assembly, vacuum pump, hoist or other essential component.		
Likelihood:	M	Likelihood Basis: Components are likely to require replacement within the next 5 years.
Consequence:	L	Consequence Basis: Availability of alternate Pu-conversion capability by muffle furnaces, in conjunction with the low production rates for the capability maintenance plan allow the consequences to be low.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: Procurement of spare parts, development of a maintenance plan and the return of DMO-3 to operation all combine to mitigate the risk associated with DMO-2 component failure.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: Spare parts and alternate Pu-conversion capability are acceptable at the current production levels.		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: LANL has spare parts and can continue Pu Conversion while DMO-2 maintenance or repair is conducted.

ARIES Risk/Opportunity Identification Form Pu Conversion DMO

ID Number: D-3 See D-2	Revision: 1	Last Evaluated: 2/22/17	Status: Closed
Event Title: DMO-2 Vacuum Pump Failure			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 5/19/16	
Processes Affected: Pu Conversion			

Initial Evaluation

Statement of Event: The event is loss of the DMO-2 vacuum pump, system piping, or control system.		
Likelihood:	M	Likelihood Basis: Components are likely to require replacement within the next 5 years.
Consequence:	L	Consequence Basis: Spare parts and availability of alternate Pu-conversion capability by DMO-3 and/or muffle furnaces.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: N/A
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: Replacement is likely within the next 5 years, but consequences are low at the current production rate. DMO-3 and muffle furnace oxidation provide a backup capability.		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: This item is covered by D-2. LANL has spare parts and can continue Pu conversion while DMO-2 maintenance or repair is conducted.

ARIES Risk/Opportunity Identification Form Pu Conversion DMO

ID Number: D-4	Revision: 1	Last Evaluated: 2/22/17	Status: Watch list
Event Title: DMO-2 Control Panel Failure			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 5/19/16	
Processes Affected: Pu Conversion			

Initial Evaluation

Statement of Event: The event is the loss of the control rack including the PLC and associated instrumentation.		
Likelihood:	M	Likelihood Basis: PLC-5 is currently reliable but no longer supported by Allen Bradley. A new PLC (control Panel) is likely to be needed prior to the completion of the 5 year evaluation period. A new computer is expected to be installed in FY 17.
Consequence:	M	Consequence Basis: DMO-2 is not available without the control system but the alternate Pu-conversion capability by DMO-3 and/or muffle furnaces, moderates the consequences.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: This is based on the successful operation of DMO-2, the expected return of DMO-3 to operable status in FY17, and the availability of the muffle furnaces. Spare parts, such as the PLC, remain a concern.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: At the current capability plan production rate, DMO-3 and muffle furnace oxidation provide a backup capability. If the production targets are increased the consequences will be re-evaluated.		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	M	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: DMO-2 will likely be shut down for computer and LVCCWS replacement, after completion of FY 17 production. DMO-3 (when returned to service) and muffle furnace oxidation will provide a back-up capability.

ARIES Risk/Opportunity Identification Form Pu Conversion DMO

ID Number: D-5 see D-2	Revision: 1	Last Evaluated: 2/22/17	Status: Closed
Event Title: DMO-2 Hoist Failure			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 5/19/16	
Processes Affected: Pu Conversion			

Initial Evaluation

Statement of Event: The event is loss of the DMO-2 hoist for moving the basket and lid.		
Likelihood:	L	**Likelihood Basis:** The hoist is reliable, but has been in use for several years.
Consequence:	M	**Consequence Basis:** DMO-2 operation is lost. However, spare parts and availability of alternate Pu-conversion capability by DMO-3 and/or muffle furnaces limit the consequences of the hoist failure to DMO-2 for the period of time it takes to repair or replace the hoist.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	**Description:** N/A
Implementation Cost:	0	**Basis for Cost:** N/A
Implementation Schedule:	0	**Basis for Schedule:** N/A

Residual Risk Evaluation

Statement of Residual Event: Spare parts and alternate Pu-conversion capability are acceptable at the current production levels.		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	M	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: This item has been combined with D-2. LANL has spare parts and can continue Pu conversion while DMO-2 hoist maintenance or repair is conducted.

ARIES Risk/Opportunity Identification Form Pu Conversion DMO

ID Number: D-6	Revision: 1	Last Evaluated: 2/22/17	Status: Active
Event Title: DMO-2 LVCCWS Replacement			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 5/19/16	
Processes Affected: Pu Conversion			

Initial Evaluation

Statement of Event: The event is failure to install new LVCCWS on schedule.		
Likelihood:	M	Likelihood Basis: The LVCCWS is expected to be replaced after completion of FY 17 ARIES oxide production. The moderate likelihood is based on uncertainty about the installation date and limited availability of craft personnel. .
Consequence:	L	Consequence Basis: The system is currently operable. Replacement is not required for operation. The new LVCCWS improves reliability. Failure to install before FY-18. might affect (delay) operations. However, alternate Pu conversion capability is expected to be available.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: Work with NPI-8 to ensure the project remains on schedule.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: LVCCWS replacement is expected in FY 17 after completion of the DMO-2 production. DMO-3 and muffle furnace oxidation will provide a backup capability if LVCCWS replacement is delayed.		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: The replaced LVCCWS improves reliability, but operation with the current system is possible without replacement.

ARIES Risk/Opportunity Identification Form Pu Conversion DMO

ID Number: D-7	Revision: 1	Last Evaluated: 2/22/17	Status: Active
Event Title: DMO-3 Oxidizer/Calciner Furnace Failure			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 5/19/16	
Processes Affected: Pu Conversion			

Initial Evaluation

Statement of Event: The event is oxidizer or calciner furnace failure due to loss of a major component such as the furnace body, lid, heater elements, basket, auger, auger motor, pump, hoist, control system or basket motor.		
Likelihood:	L	Likelihood Basis: DMO-3 has not experienced much use since its installation. Components such as heater elements, augers, motors, and baskets may require replacement within the next 5 years. Passive components such as the furnace body or lid are more reliable and are not anticipated to require replacement, however their loss would likely result in an indefinite loss of the furnace.
Consequence:	L	Consequence Basis: DMO-3 would stop but processing could continue with DMO-2 or muffle furnaces. Low consequence is based on spare parts and availability of alternate Pu-conversion capability by DMO-2 and/or muffle furnaces
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: Procurement of spare parts and development of maintenance plans, are expected to keep this risk low.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: Spare parts and alternate Pu-conversion capability are acceptable for maintaining the current production levels.		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: DMO-3 will undergo readiness review (or MSA) before returning to operable status by the end of FY-17.

ARIES Risk/Opportunity Identification Form Pu Conversion DMO

ID Number: D-8 see D-7	Revision: 1	Last Evaluated: 2/22/17	Status: Closed Per D-7
Event Title: DMO-3 Calciner Furnace Failure			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 5/19/16	
Processes Affected: Pu Conversion			

Initial Evaluation

Statement of Event: The event is loss of the DMO-3 calciner furnace, furnace tube, auger, or offload assembly.		
Likelihood:	M	Likelihood Basis: Components are likely to require replacement within the next 5 years.
Consequence:	L	Consequence Basis: Consequences are low due to spare parts and availability of alternate Pu-conversion capability by DMO-3 and/or muffle furnaces.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: N/A
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: Spare parts and alternate Pu-conversion capability are acceptable at the current production levels.		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: This risk has been incorporated into D-7. LANL has spare parts and can continue Pu conversion while DMO-3 maintenance or repair is conducted.

ARIES Risk/Opportunity Identification Form Pu Conversion DMO

ID Number: D-9 see D-7	Revision: 1	Last Evaluated: 2/22/17	Status: Closed Per D-7
Event Title: DMO-3 Vacuum Pump Failure			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 5/19/16	
Processes Affected: Pu Conversion			

Initial Evaluation

Statement of Event: The event is loss of the DMO-3 vacuum pump, system piping, or control system.		
Likelihood:	M	Likelihood Basis: Components are likely to require replacement within the next 5 years.
Consequence:	L	Consequence Basis: The consequences are low due to spare parts and availability of alternate Pu-conversion capability by DMO-2 and/or muffle furnaces
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: N/A
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: Replacement is likely within the next 5 years, but consequences are low at the current production rate. DMO-2 and muffle furnace oxidation provide a backup capability.		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: This risk has been incorporated into D-7. LANL has spare parts and can continue Pu Conversion while DMO-3 maintenance or repair is conducted.

ARIES Risk/Opportunity Identification Form Pu Conversion DMO

ID Number: D-10 See D-7	Revision: 1	Last Evaluated: 2/22/17	Status: Closed Per D-7
Event Title: DMO-3 Control Panel Failure			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 5/19/16	
Processes Affected: Pu Conversion			

Initial Evaluation

Statement of Event: The event is the loss of the control rack, including the PLC and associated instrumentation.		
Likelihood:	L	Likelihood Basis: The low likelihood is based on assuming upgrades to allow automatic operation is successful. (readiness review and return to service in 2017).
Consequence:	M	Consequence Basis: DMO-3 is not available without the control system, but the alternate Pu-conversion capability by DMO-2 and/or muffle furnaces moderates the consequences.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description:N/A
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: Even though the control system is relatively new, the upgrade to allow automatic operation renders some uncertainty. At the current production rate, DMO-2 and muffle furnace oxidation provide a backup capability		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	M	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: This risk has been incorporated into D-7. The ability to replace out of production spares such as the PLC is being addressed elsewhere.

ARIES Risk/Opportunity Identification Form Pu Conversion DMO

ID Number: D-11 see D-7	Revision: 1	Last Evaluated: 2/22/17	Status: Closed Per D-7
Event Title: DMO-3 Hoist Failure			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 5/19/16	
Processes Affected: Pu Conversion			

Initial Evaluation

Statement of Event: The event is loss of the DMO-3 hoist for moving the basket and lid.		
Likelihood:	L	Likelihood Basis: The hoist is considered to be reliable.
Consequence:	M	Consequence Basis: DMO-3 operation would be lost. However, spare parts and availability of alternate Pu-conversion capability by DMO-2 and/or muffle furnaces limit the consequences of the hoist failure to DMO-3 for the period of time it takes to repair or replace the hoist.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: N/A
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: Spare parts and alternate Pu-conversion capability are acceptable at the current production levels.		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	M	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: This risk has been incorporated into D-7. LANL has spare parts and can continue Pu conversion while DMO-3 hoist maintenance or repair is conducted.

ARIES Risk/Opportunity Identification Form Pu Conversion DMO

ID Number: D-12-completed	Revision: 1	Last Evaluated: 2/22/17	Status: Closed
Event Title: DMO-3 LVCCWS Replacement			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 5/19/16	
Processes Affected: Pu Conversion			

Initial Evaluation

Statement of Event: The event is failure to install new LVCCWS on schedule.		
Likelihood:	M	Likelihood Basis: The LVCCWS is expected to be replaced prior to resumption of ARIES processing. The moderate likelihood is based on uncertainty about the installation date and resumption date.
Consequence:	L	Consequence Basis: Replacement is required for operation. The new LVCCWS is required for compliance with facility requirements. Failure to install before resumption might affect (delay) operations following resumption. However, alternate Pu conversion is expected to be available.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: N/A
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: Replacement is scheduled for FY16. Consequences of a delay are low at the current production rate. DMO-2 and muffle furnace oxidation provide a backup capability.		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: The replacement was completed in FY16. Resumption, including readiness, and deliberate operations are scheduled for FY17. The replaced LVCCWS complies with facility requirements. Therefore, this item is closed.

ARIES Risk/Opportunity Identification Form Pu Conversion DMO

ID Number: D-13 see PM-29	Revision: 1	Last Evaluated: 2/22/17	Status: Closed per PM-29
Event Title: Loss of Personnel			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 5/19/16	
Processes Affected: Pu Conversion			

Initial Evaluation

Statement of Event: The event is loss of skilled personnel due to aging workforce and loss of people to retirement and lack of retention.		
Likelihood:	M	Likelihood Basis: Current staffing does not allow concurrent operation of DMO-2 and 3.
Consequence:	M	Consequence Basis: Loss of staff would affect both DMO-2 and 3.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: Sufficient cross-training prevents a single loss of personnel from completely stopping production.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	M	Residual Likelihood Basis: N/A
Residual Consequence:	M	Residual Consequence Basis: N/A
Residual Risk Level:		

Additional Comments and Status

Comments: This risk has been combined into PM-29 which addresses personnel risk for the program. Current staffing is not at a level that allows operation of DMO-2 and DMO-3 concurrently.

ARIES Risk/Opportunity Identification Forms NDA

ID Number: N-1	Revision: 1	Last Evaluated: 2/22/17	Status: Active
Event Title: Failure of ARIES NDA System Components			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/22/16	
Processes Affected: Nondestructive Assay			

Initial Evaluation

Statement of Event: The event is failure of the ARIES calorimeter, gantry robot, gamma isotopic, or multiplicity equipment.		
Likelihood:	M	Likelihood Basis: The ARIES NDA system is judged to be likely to experience short outages, consistent with previous operational experience, during the next 5 years.
Consequence:	L	Consequence Basis: The system is backed up by the facility NDA system, Thus, the main effect of an outage is the movement delays associated with use of the facility NDA system. The consequences are judged to be low because of the low rate of production. Consequences will be more significant if production rate is increased.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: Continued routine maintenance is expected to maintain the availability of the NDA system.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: With the availability of the facility backup system, residual consequences of ARIES NDA outages are low.
Residual Risk Level:		

Additional Comments and Status

Comments: See comment for N-6.

ARIES Risk/Opportunity Identification Form NDA

ID Number: N-2 see N-1	Revision: 1	Last Evaluated: 2/22/17	Status: Closed per N-1
Event Title: Gamma Isotopic System			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/22/16	
Processes Affected: Nondestructive Assay			

Initial Evaluation

Statement of Event: The event is failure of the ARIES gamma-ray isotopic system.		
Likelihood:	M	Likelihood Basis: The ARIES NDA system, which includes the gamma assay system, is currently unavailable waiting on criticality analysis. A relatively complicated system, the Gamma Isotope System is judged to experience a few short-term outages in the next 5 years for various reasons, e.g., calibration, maintenance, etc.
Consequence:	L	Consequence Basis: The system is backed up by the facility NDA system, thus the main effect of an outage is the movement delays associated with use of the facility NDA system.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: Resumption of ARIES NDA following the criticality analysis is expected.
Implementation Cost:	0	Basis for Cost:N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event**:** After completion of the criticality study and implementation of appropriate criticality limits, the system is expected to have a normal reliability, which should result in few outages of short duration.		
Residual Likelihood:	M	**Residual Likelihood Basis:** Unchanged
Residual Consequence:	L	**Residual Consequence Basis:** Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: This risk has been incorporated into N-1. See comment for N-6.

ARIES Risk/Opportunity Identification Form NDA

ID Number: N-3 see N-1	Revision: 1	Last Evaluated: 2/22/17	Status: Closed per N-1
Event Title: Multiplicity Counter			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/22/16	
Processes Affected: Nondestructive Assay			

Initial Evaluation

Statement of Event: The event is failure of the ARIES multiplicity counter.		
Likelihood:	M	Likelihood Basis: The ARIES NDA system, which includes the multiplicity counter, is currently unavailable waiting on criticality analysis. A relatively complicated system, the multiplicity system is judged to experience a few short-term outages in the next 5 years for various reasons, e.g., calibration, maintenance etc.
Consequence:	L	Consequence Basis: The system is backed up by the facility NDA system, thus the main effect of an outage is the movement delays associated with use of the facility NDA system.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: Criticality analysis is addressed as a separate risk.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: After completion of the criticality study and implementation of appropriate criticality limits, the system is expected to have a normal reliability, which should result in few outages of short duration.		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Operation will proceed more efficiently.
Residual Risk Level:		

Additional Comments and Status

Comments: This risk has been incorporated into N-1. See comment for N-6.

ARIES Risk/Opportunity Identification Form NDA

ID Number: N-4 see N-1	**Revision:** 1	**Last Evaluated:** 2/22/17	**Status:** Closed per N-1
Event Title: Gantry Robot			
Type (Risk/Opp): Risk	**Contact:** Process Engineer	**Date Identified:** 6/22/16	
Processes Affected: Nondestructive Assay			

Initial Evaluation

Statement of Event: The event is failure of the ARIES NDA gantry robot.		
Likelihood:	L	**Likelihood Basis:** The robot is considered to be a relatively reliable system.
Consequence:	L	Consequence Basis: If the robot is out of service, containers may be moved manually with appropriate ergonomic considerations. The NDA backup by the facility NDA system continues to make the consequences low.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: N/A
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: After completion of the criticality study and implementation of appropriate criticality limits, the system is expected to have a normal reliability, which should result in few outages of short duration.		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: This risk has been incorporated into N-1. See comment for N-6.

ARIES Risk/Opportunity Identification Form NDA

ID Number: N-5 see PM-29	Revision: 1	Last Evaluated: 2/22/17	Status: Closed per PM-29
Event Title: NDA Personnel Availability			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/22/16	
Processes Affected: Nondestructive Assay			

Initial Evaluation

Statement of Event: The event is loss of skilled personnel due to aging workforce and loss of people to retirement and lack of retention.		
Likelihood:	M	Likelihood Basis: Personnel turnover is considered likely during the next 5 years.
Consequence:	L	Consequence Basis: The consequences of personnel turnover is considered to be low because the primary consequence is judged to be a reduction in productivity. Sufficient personnel are cross-trained such that no single loss will stop production.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: Maintenance of the current staffing level is assumed.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Operation will proceed more efficiently.
Residual Risk Level:		

Additional Comments and Status

Comments: This risk has been combined into PM-29 which addresses personnel risk for the program. LANL has a staffing plan. The current staffing level for the NDA team is sufficient, however support functions necessary for movement of material in the event of full facility resumption is uncertain.

ARIES Risk/Opportunity Identification Form NDA

ID Number: N-6	Revision: 1	Last Evaluated: 2/22/17	Status: Watch list
Event Title: NDA-Criticality Analysis			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/22/16	
Processes Affected: Nondestructive Assay			

Initial Evaluation

Statement of Event: The event is that criticality analysis and supporting evaluations are not completed for ARIES NDA in time to support resumption of processing.

Likelihood:	H	Likelihood Basis: Criticality analysis for NDA is low priority and it has not been completed. ARIES production is resuming without the ARIES NDA system. This requires more complicated movement of material through the facility.
Consequence:	L	Consequence Basis: The system is backed up by the facility NDA system, thus the main effect of not having the criticality analysis is the movement delays associated with use of the facility NDA system.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The revised criticality analysis is low on the priority list. The backup (facility) NDA capability is available. Once completed, the analysis is not expected to result in significant changes to ARIES NDA operations.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: After completion of the criticality study and implementation of appropriate criticality limits, the system is expected to have a normal reliability, which should result in few outages of short duration.

Residual Likelihood:	H	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Operation will proceed using the facility NDA capability.
Residual Risk Level:		

Additional Comments and Status

Comments: Facility NDA services are expected to be available for the initial resumption of ARIES processing. Criticality evaluation for ARIES NDA is on the schedule but low priority. The date for resumption of ARIES NDA activities is, therefore, uncertain.

ARIES Risk/Opportunity Identification Form NDA

ID Number: N-7	Revision: 1	Last Evaluated: 6/22/17	Status: Watch list
Event Title: NDA-modifications due to container requirements			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/22/16	
Processes Affected: Nondestructive Assay			

Initial Evaluation

Statement of Event: The event is that the standard 3013 package is replaced by a new container is not compatible with the current ARIES NDA equipment. .

Likelihood:	M	Likelihood Basis: Based on the Technology Management Plan for packaging, if a new container is designed it will not work in the ARIES NDA system.
Consequence:	L	Consequence Basis: If the new container is required to be used and theARIES NDA system cannot be utilized without revision then the ARIES NDA system will require modification. This is a significant consequence. However it can be mitigated by utilization of the facility NDA systems while the ARIES NDA system is being modified.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The risk will be monitored because it is not within the control of the project. until container requirements are developed by NNSA/LANL.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: .

Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis**:** Operation will proceed using the facility NDA capability.
Residual Risk Level:		

Additional Comments and Status

Comments: Facility NDA services are expected to be available for the initial resumption of ARIES processing. Criticality evaluation for ARIES NDA is on the schedule but low priority. The date for resumption of ARIES NDA activities is, therefore, uncertain. If modification of the ARIES NDA for use with a new container design, such as the SAVY cans, is mandated, then continued use of the facility NDA systems is possible.

ARIES Risk/Opportunity Identification Forms Oxide Processing & Characterization

ID Number: C-1 - completed	Revision: 1	Last Evaluated: 2/22/17	Status: Closed
Event Title: Surface Area Analyzer (single-point failure)			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/23/16	
Processes Affected: Oxide Processing and Characterization			

Initial Evaluation

Statement of Event: The event is failure to install the surface area analyzer prior to resumption of ARIES production or a failure of the analyzer after resumption of production.		
Likelihood:	M	**Likelihood Basis:** The new surface area analyzer is due to be installed in FY16. The likelihood of being installed before production starts or remaining operable for the next 5 years is judged to be moderate.
Consequence:	M	**Consequence Basis:** The surface area analyzer does not have an installed backup. Its unavailability does not stop processing, but material cannot be accepted without the analysis. It represents a delay in acceptance but not processing, and is therefore judged to be of moderate consequence.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: A backup surface area analyzer should be kept as a spare. Consideration should be given to actions that can shorten installation time.
Implementation Cost:	0	Basis for Cost: The cost of a backup should be considered in with spare equipment.
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: If a spare is available and the production rate remains at the current low level, it is likely that samples can be accumulated and run as a campaign without affecting the production rate.		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: This item is closed. The replacement analyzer was installed and now the risk is a relegated to a routine spare parts issue. The spare surface area analyzer was installed in FY16. A backup surface area analyzer should be procured and made available as a spare. Installation time may be as much as 6 months. Ways to reduce installation time should be considered.

ARIES Risk/Opportunity Identification Form Oxide Processing & Characterization

ID Number: C-2	Revision: 1	Last Evaluated: 2/22/17	Status: Inactive
Event Title: Surface Area Analyzer Computer or Software(single-point failure)			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/23/16	
Processes Affected: Oxide Processing and Characterization			

Initial Evaluation

Statement of Event: The event is failure of the surface area computer or associated software.		
Likelihood:	L	**Likelihood Basis:** The computer and software have a reliable history and the failure is judged to be low.
Consequence:	L	**Consequence Basis:** Backup software and computer are available and the delay in installing is not expected to be significant relative to the rate of oxide production.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: N/A
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: If a spare is available and the production rate remains at the current low level, it is likely that samples can be accumulated and run as a campaign without affecting the production rate.		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: The time associated with replacement of the computer and software is not expected to be large compared with the expected production rate.

ARIES Risk/Opportunity Identification Form Oxide Processing & Characterization

ID Number: C-3	Revision: 1	Last Evaluated: 2/22/17	Status: Inactive
Event Title: Blender for Oxide Processing			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/23/16	
Processes Affected: Oxide Processing and Characterization			

Initial Evaluation

Statement of Event: The event is loss of a blender. A backup blender is available, and could be used. .		
Likelihood:	L	Likelihood Basis: The event is judged to be unlikely based on the simplicity and past reliability of the blender.
Consequence:	L	Consequence Basis: The consequence of losing the blender is judged to be low because processing may continue using the other blender..
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: N/A
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: If he production rate remains at the current low level, it is likely that samples can be accumulated and run as a campaign without affecting the production rate, and the use of only one blender will not affect production rate.		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: The delay in operation is judged to be lower because a backup blender can be made available within a short time relative to the low production rate.
Residual Risk Level:		

Additional Comments and Status

Comments: The blender is reliable, however in the event that it requires replacement, it could delay processing.

ARIES Risk/Opportunity Identification Form Oxide Processing & Characterization

ID Number: C-4	Revision: 1	Last Evaluated: 2/22/17	Status: Inactive
Event Title: Rotary Sample Divider (Riffler)			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/23/16	
Processes Affected: Oxide Processing and Characterization			

Initial Evaluation

Statement of Event: The event is loss of the rotary sample riffler.		
Likelihood:	L	Likelihood Basis: The event is judged to be unlikely based on the simplicity and past reliability of the riffler.
Consequence:	L	Consequence Basis: Processing could continue, but analysis would be delayed. Samples can be campaigned to recover lost time. A spare is available so replacement is not expected to be difficult.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: N/A
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: A spare is available and if the production rate remains at the current low level, it is likely that samples can be accumulated and run as a campaign without affecting the production rate.		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: A spare is available and installation is not expected to take a long time relative to sample analysis.

ARIES Risk/Opportunity Identification Form Oxide Processing & Characterization

ID Number: C-5	Revision: 1	Last Evaluated: 2/22/17	Status: Inactive
Event Title: Loss of Milling Capability			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/23/16	
Processes Affected: Oxide Processing and Characterization			

Initial Evaluation

Statement of Event: The event is loss of the mill.		
Likelihood:	L	Likelihood Basis: The mill is a standard piece of equipment and is considered reliable, thus likelihood of mill failure is considered low.
Consequence:	L	Consequence Basis: Material processing would likely stop if material could not be blended. A second mill is available in a different GB and a spare is available to be installed.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: N/A
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: A spare is available and if the production rate remains at the current low level, it is likely that a delay in milling can be accommodated without significant effect on overall production.		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: A spare is available and installation is not expected to take a long time relative to the current production rate.

ARIES Risk/Opportunity Identification Form Oxide Processing & Characterization

ID Number: C-6	Revision: 1	Last Evaluated: 3/9/17	Status: Watch list
Event Title: Simultaneous Thermal Analyzer Failure			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/23/16	
Processes Affected: Oxide Processing and Characterization			

Initial Evaluation

Statement of Event: The event is loss of the STA, including essential subsystems such as the mass spectrometer, transfer line, control systems etc, which are single-point failures.		
Likelihood:	M	Likelihood Basis: The STA failure or a need to replace it during the 5 years of this evaluation is considered to be moderate.
Consequence:	M	Consequence Basis: There is no installed backup, a spare STA is available but typical installation time is approximately 6 months. The consequence is delay in analysis until the equipment is replaced or repaired.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: The risk is associated with the long delay in replacement of the STA should it fail. The risk can be mitigated through advanced planning for a replacement and spare parts inventory, that will reduce the replacement time.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: Maintaining a spare and preplanning the replacement will reduce the consequences of a failure of the STA.		
Residual Likelihood:	M	Residual Likelihood Basis:
Residual Consequence:	L	Residual Consequence Basis: The consequence to production is low because it is not on the production critical path.
Residual Risk Level:		

Additional Comments and Status

Comments: At the current production rate, samples can be accumulated and run in a campaign. This provides a slight mitigation of delays due to equipment failure. However, expedition of the equipment replacement process through pre-planning seems appropriate. The mass spec is approaching its lifetime, the temperature control system uses out of date Windows XP.

ARIES Risk/Opportunity Identification Form Oxide Processing & Characterization

ID Number: C-7 see C-6	Revision: 1	Last Evaluated: 3/9/17	Status: closed see C-6
Event Title: Mass Spectrometer Failure (single point)			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/23/16	
Processes Affected: Oxide Processing and Characterization			

Initial Evaluation

Statement of Event: The event is failure of the Pfeiffer Thermostar mass spectrometer, which is approaching its expected lifetime.

Likelihood:	M	Likelihood Basis: The mass spectrometer is approaching its expected lifetime, so it is reasonable to expect it to fail or need replacement within the next 5 years.
Consequence:	M	Consequence Basis: There is no installed backup; a spare is available but typical installation time is uncertain. The consequence is delay in analysis until the equipment is replaced or repaired.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: At the current production rate, there is capability to accumulate samples for analysis while a replacement MS is installed.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: Maintaining a spare and preplanning the replacement will reduce the consequences of a failure of the MS.

Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	M	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: This item has been incorporated into item C-6. At the current production rate, samples can be accumulated and run in a campaign. This provides a slight mitigation of delays due to equipment failure. However, expedition of the equipment replacement process through pre-planning seems appropriate or developing the capability to use a different MS.

ARIES Risk/Opportunity Identification Form Oxide Processing & Characterization

ID Number: C-8 see C-6	Revision: 1	Last Evaluated: 3/8/17	Status: Closed, see C-6
Event Title: Heated Transfer Line (single point)			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/23/16	
Processes Affected: Oxide Processing and Characterization			

Initial Evaluation

Statement of Event: The event is failure of the heated gas transfer line.		
Likelihood:	L	Likelihood Basis: The heated transfer line has performed reliably, so it has been judged to have a low likelihood of failure.
Consequence:	M	Consequence Basis: The consequence is delay in analysis until the equipment can be recalibrated for measurements without the heated transfer line, which would result in added uncertainty to the measurements.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description:
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: Maintaining a spare and preplanning the replacement will reduce the consequences of a failure of the heated gas transfer line.		
Residual Likelihood:	L	Residual Likelihood Basis:
Residual Consequence:	M	Residual Consequence Basis:
Residual Risk Level:		

Additional Comments and Status

Comments: This item has been incorporated into item C-6. The heated transfer line has performed reliably, but it is prudent to have a spare.

ARIES Risk/Opportunity Identification Form Oxide Processing & Characterization

ID Number: C-9 see C-6	Revision: 1	Last Evaluated: 3/8/17	Status: Closed see C-6
Event Title: Transfer Line Temperature Control (single point)			
Type (Risk/Opp): Risk	Contact: Susan Klimowicz	Date Identified: 6/23/16	
Processes Affected: Oxide Processing and Characterization			

Initial Evaluation

Statement of Event: The event is failure of the gas transfer line temperature Windows XP controller.		
Likelihood:	M	Likelihood Basis: The temperature control system runs on Windows XP, which is not supported by LANL, thus its failure likelihood is considered moderate.
Consequence:	M	Consequence Basis: The consequence is delay in analysis until the equipment is replaced or repaired.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: The controller runs on Windows XP, which is not supported by LANL. A spare is available, but in the long term it needs to be updated to a later Windows version.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	L	Residual Likelihood Basis: Running on a more recent version of Windows is expected to be more reliable.
Residual Consequence:	L	Residual Consequence Basis: A more reliable system allows for a more reliable spare.
Residual Risk Level:		

Additional Comments and Status

Comments: This item has been incorporated into item C-6.

ARIES Risk/Opportunity Identification Form Oxide Processing & Characterization

ID Number: C-10	Revision: 1	Last Evaluated: 3/8/17	Status: Watch list
Event Title: Laser Diffraction Particle Size Analyzer (single point)			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/23/16	
Processes Affected: Oxide Processing and Characterization			

Initial Evaluation

Statement of Event: The event is failure of the particle size analyzer.		
Likelihood:	H	After being idle for a year or two, the system is expected to fail when processing resumes. However, it is currently operable.
Consequence:	M	Consequence Basis: The consequence is delay in analysis until the equipment is replaced or repaired.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: Run to Failure then replace the particle size analyzer.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	L	Residual Likelihood Basis: The new analyzer is expected to reduce the likelihood of being unable to conduct the analysis.
Residual Consequence:	M	Residual Consequence Basis: The consequences would not be changed.
Residual Risk Level:		

Additional Comments and Status

Comments: A new Particle Size Analyzer will be replaced when the current system fails.

ARIES Risk/Opportunity Identification Form Oxide Processing & Characterization

ID Number: C-11	Revision: 1	Last Evaluated: 3/8/17	Status: Inactive
Event Title: Tapped Density Tester (single point)			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/23/16	
Processes Affected: Oxide Processing and Characterization			

Initial Evaluation

Statement of Event: The event is loss of the tapped density tester.		
Likelihood:	L	Likelihood Basis: The tapped density tester is considered reliable and easy to replace.
Consequence:	L	Consequence Basis: An interference in performing tapped density measurements would result, but it is not expected to be of long duration.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: N/A
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments:

ARIES Risk/Opportunity Identification Form Oxide Processing & Characterization

ID Number: C-12 see PM-29	Revision: 1	Last Evaluated: 2/22/17	Status: Closed per PM-29
Event Title: Personnel Availability			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/23/16	
Processes Affected: Oxide Processing and Characterization			

Initial Evaluation

Statement of Event: The event is loss of skilled personnel due to aging workforce and loss of people to retirement and lack of retention.

Likelihood:	L	Likelihood Basis: Personnel turnover for the next 5 years is expected to be consistent with the past.
Consequence:	L	**Consequence Basis:** Replacing personnel does affect production but is not expected to result in failure to meet expected production.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: N/A
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event:

Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: This risk has been combined into PM-29 which addresses personnel risk for the program. LANL has a staffing plan. The current staffing level for the team is sufficient. Sufficient personnel are cross-trained such that no single loss will stop production.

ARIES Risk/Opportunity Identification Form Oxide Processing & Characterization

ID Number: C-13	Revision: 1	Last Evaluated: 3/8/17	Status: Inactive
Event Title: Maintenance			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/23/16	
Processes Affected: Oxide Processing and Characterization			

Initial Evaluation

Statement of Event: The event is delays in replacement of equipment that fails in service.		
Likelihood:	L	Likelihood Basis: In the past, equipment failures have not been a significant contributor to failures to achieve production.
Consequence:	M	Consequence Basis: Some pieces of equipment have long replacement times. However at the current low production rate and with the ability to campaign sample analysis, the effects of corrective maintenance delays is considered moderate.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: N/A
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: Maintenance planning has been identified as applicable to all modules and is listed on the watch list as an overall risk. It is not feasible to keep backup equipment in the glovebox line for each piece of equipment. Some pieces of equipment are subject to long administrative delays in replacement.

ARIES Risk/Opportunity Identification Forms QA Support

ID Number: Q-1	Revision: 1	Last Evaluated: 3/08/17	Status: Watch list
Event Title: QA Support BLB, CofC and CofA Preparation			
Type (Risk/Opp): Risk	Contact: PAG Quality Engineer	Date Identified: 6/27/16	
Processes Affected: QA Support			

Initial Evaluation

Statement of Event: The event is inability to prepare acceptance documentation per PA-MAP-01004.		
Likelihood:	M	Likelihood Basis: The next set of acceptance documents will be prepared in accordance with the new Manufacturing Admin Procedure, which is based on weapons production and acceptance. The initial use of this admin procedure for non-weapons manufacturing is judged to be likely to have unforeseen problems.
Consequence:	L	Consequence Basis: The admin procedure does not affect the conformance of the product with requirements, so it is likely that resolutions of problems will be achievable without rejection of the product.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The first few lots accepted per MAP 01004 are expected to result in modifications to the MAP and to the acceptance procedures for the packaged oxide. After these modifications, acceptance is expected to operate more routinely.
Implementation Cost:	0	Basis for Cost: Costs are built into the acceptance cost for the FY17 production.
Implementation Schedule:	0	Basis for Schedule: Based on the schedule for lot acceptance

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	L	Residual Likelihood Basis: After successful acceptance of the first lots, it is unlikely that acceptance per MAP 01004 will not present an unusual risk.
Residual Consequence:	L	Residual Consequence Basis: After successful acceptance of the first lots, it is likely that the remainder of the acceptances will be equivalent to the process in the past.
Residual Risk Level:		

Additional Comments and Status

Comments: Product acceptance is a regular item for the watch list.

ARIES Risk/Opportunity Identification Form QA Support

ID Number: Q-2	Revision: 1	Last Evaluated: 3/8/17	Status: Active
Event Title: QA Maintaining SRNL as an Approved Supplier			
Type (Risk/Opp): Risk	Contact: PAQ Quality Engineer	Date Identified: 6/27/16	
Processes Affected: QA Support			

Initial Evaluation

Statement of Event: The event is inability to keep SRNL on the approved suppliers list.		
Likelihood:	L	Likelihood Basis: SRNL has been added to the list of approved suppliers for analytical chemical analysis. Funding for maintaining them on the IESL is assumed. It is not likely that they will be removed from the IESL.
Consequence:	M	Consequence Basis: The consequences would be a delay in approval of the produced material until approved radiochemical analysis results become available.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: N/A
Implementation Cost:	0	**Basis for Cost:** Costs are built into the cost for the FY17 production, which includes review of changes to SRNL processes and a surveillance (source inspection) of their processes.
Implementation Schedule:	0	Basis for Schedule: Based on the schedule for submittal of samples for SRNL analysis

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	M	Residual Consequence Basis: A delay in the analysis schedule while issues are resolved is expected to have a minimal effect on the production schedule.
Residual Risk Level:		

Additional Comments and Status

Comments: The MOU with SRNL is reviewed annually.

ARIES Risk/Opportunity Identification Form QA Support

ID Number: Q-3	Revision: 1	Last Evaluated: 3/8/17	Status: Watch list
Event Title: ARIES QA Program			
Type (Risk/Opp): Risk	Contact: PAQ Quality Engineer	Date Identified: 6/27/16	
Processes Affected: QA Support			

Initial Evaluation

Statement of Event: The event is a breakdown in the ARIES QA Program, resulting in non-compliances and potentially re-work of blend lot production.		
Likelihood:	L	Likelihood Basis: A complete breakdown of the QA program is not likely. However, it is likely that elements of the program will periodically be found to need improvement.
Consequence:	M	Consequence Basis: The consequences would be a delay in approval of product oxide (and in some cases a delay in processing or re-work) until quality program corrective actions are implemented.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The annual outside audit, customer audits, and the maintenance of the quality staff are already a part of the ARIES QA program.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	L	**Residual Likelihood Basis:** Unchanged
Residual Consequence:	M	Residual Consequence Basis: Some delays, while quality findings are resolved, are to be expected. Therefore, the residual consequences are judged to be moderate.
Residual Risk Level:		

Additional Comments and Status

Comments: Maintain on the watch list as a means of project oversite.

ARIES Risk/Opportunity Identification Forms Engineering Support

ID Number: E-1	Revision: 1	Last Evaluated: 3/8/17	Status: Active
Event Title: Engineering Support for LVCCWS Replacement on DMO-2			
Type (Risk/Opp): Risk	Contact: AET-5	Date Identified: 6/8/16	
Processes Affected: Engineering Support			

Initial Evaluation

Statement of Event: The event is inability to support installation of the LVCCWS for DMO-2.		
Likelihood:	L	Likelihood Basis: Design and cold testing is complete; support for installation is not expected to be significant.
Consequence:	L	Consequence Basis: DMO-2 can operate without replacement of the LVCCWS, so the consequences are only applicable to delays in DMO-2 after entry into the installation phase.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The outage time of the DMO-2 is expected to be low, and the installation is expected to extend life and reliability.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains low. The installation is on schedule for FY17. It is coordinated with DMO-3 so that one system will be available.		
Residual Likelihood:	L	Residual Likelihood Basis: The installation is already scheduled; the inability of engineering to support the installation is unlikely.
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: Design and cold testing are complete. AET-5 support for installation is minimal. It is scheduled in conjunction with DMO-2 production in FY17.

ARIES Risk/Opportunity Identification Form Engineering Support

ID Number: E-2	Revision: 1	Last Evaluated: 3/8/17	Status: Complete
Event Title: Engineering Support for LVCCWS Replacement on DMO-3			
Type (Risk/Opp): Risk	Contact: Troy Harden	Date Identified: 6/8/16	
Processes Affected: Engineering Support			

Initial Evaluation

Statement of Event: The event is inability to support installation of the LVCCWS for DMO-3.		
Likelihood:	L	Likelihood Basis: Design and cold testing are complete. Support for installation is not expected to be significant.
Consequence:	L	Consequence Basis: Replacement of the LVCCWS for DMO-3 is a requirement for resumption of operations, so the consequence is delay in DMO-3 return to operation.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The engineering and cold testing are complete. The engineering support for installation is not expected to be significant.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains low. The installation is on schedule for FY16		
Residual Likelihood:	L	Residual Likelihood Basis: The installation is already scheduled. The inability of engineering to support the installation is unlikely.
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: Installation is complete. AET-5 support for readiness continues.

ARIES Risk/Opportunity Identification Form Engineering Support

ID Number: E-3	Revision: 2	Last Evaluated: 3/13/17	Status: Watch list
Event Title: Engineering Support for Control System Upgrades on ARIES Equipment			
Type (Risk/Opp): Risk	Contact: Troy Harden	Date Identified: 6/13/17	
Processes Affected: Engineering Support			

Initial Evaluation

Statement of Event: The event is a ARIES equipment outages due to failures of aging control systems.		
Likelihood:	L	Likelihood Basis: The control systems for most of the ARIES equipment needs to be updated regularly (roughly every 5 years) The DMO-3 upgrade was recently implemented. Muffle furnace upgrades are being developed.
Consequence:	M	Consequence Basis: Many of the control systems use PLC-5 logic which is no longer in production. The risk to operability of any one system is low. However, lack of production replacement parts is a concern that failures might be extended.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: DMO-3 has been updated and is waiting for readiness review. Muffle furnace control system is being upgraded. A systematic review of ARIES systems relying on out of date systems will be conducted in FY 17.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk to oxide production is low.		
Residual Likelihood:	L	Residual Likelihood Basis: Some systems have been or are being upgraded. The evaluation of out of date control systems will reveal the extent of the residual risks.
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: This risk can be re-evaluated after the extent of out of date control systems is established.

ARIES Risk/Opportunity Identification Form Engineering Support

ID Number: E-4	Revision: 0	Last Evaluated: initial	Status: Active
Event Title: Engineering Support for Pit Cutter Installation			
Type (Risk/Opp): Risk	Contact: Troy Harden	Date Identified: 6/8/16	
Processes Affected: Engineering Support			

Initial Evaluation

Statement of Event: The event is that inability to support Pit Cutter installation and testing delays the Pit Cutter installation.		
Likelihood:	L	Likelihood Basis: Design and cold testing are complete. Installation is not scheduled until 2018. The amount of installation support from AET-5 is expected to be low because the system has already been built.
Consequence:	L	Consequence Basis: Should engineering issues delay the pit cutter installation, the ability to continue PITD with the robotic lathe will not be affected.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The engineering and cold testing are complete. The engineering support for installation is not expected to be significant.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains low. The installation is on schedule for FY18.		
Residual Likelihood:	L	Residual Likelihood Basis: The installation is already scheduled. The inability of engineering to support the installation is unlikely.
Residual Consequence:	L	Residual Consequence Basis: Residual risks will mainly be associated with preparing the glovebox for pit cutter installation.
Residual Risk Level:		

Additional Comments and Status

Comments: Design and cold testing are complete. AET-5 support for installation is minimal.

ARIES Risk/Opportunity Identification Form Engineering Support

ID Number: E-5	Revision: 0	Last Evaluated: initial	Status: Active
Event Title: Engineering Support for Muffle Furnace Control System Upgrade			
Type (Risk/Opp): Risk	Contact: Troy Harden	Date Identified: 6/8/16	
Processes Affected: Engineering Support			

Initial Evaluation

Statement of Event: The event is delay in installation and testing of the new muffle furnace control system.		
Likelihood:	L	Likelihood Basis: The engineering support portion of the program is essentially finished, so it is unlikely to be delayed due to engineering support.
Consequence:	L	Consequence Basis: The control system is an upgrade, but a delay in its installation will not prevent the muffle furnaces from operation.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: N/A
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	L	Residual Likelihood Basis: The inability of engineering to support the installation is unlikely.
Residual Consequence:	L	Residual Consequence Basis: Redundancy in oxide production makes the residual consequences low.
Residual Risk Level:		

Additional Comments and Status

Comments: AET-5 support for installation is minimal.

ARIES Risk/Opportunity Identification Form Engineering Support

ID Number: E-6	Revision: 0	Last Evaluated: initial	Status: Watch list
Event Title: Engineering Support for the Conveyor Side Eject System			
Type (Risk/Opp): Opp	Contact: Troy Harden	Date Identified: 6/8/16	
Processes Affected: Engineering Support			

Initial Evaluation

Statement of Event:
The event is inoperability of the conveyor side eject system.

Likelihood:	H	Likelihood Basis: The conveyor side eject system is already unreliable. Various fixes are being considered. Therefore, the event is relative to the potential failure to solve the problem. It is likely that a solution will be found.
Consequence:	L	Consequence Basis: Processing by manual movement of material from the conveyor to the glovebox may continue, so the consequence is that the current condition remains.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: This is listed as an opportunity because the current condition remains capable of operation.
Implementation Cost:	900K fy-17	Basis for Cost: Cost for resolution will be based on a selected method for fixing the side eject system.
Implementation Schedule:	0	Basis for Schedule: Operation may continue as it currently exists. Implementation of the solution can be planned relative to operation.

Residual Risk Evaluation

Statement of Residual Event: The residual risk is continued operation with less than optimal provisions for movement of items.

Residual Likelihood:	L	Residual Likelihood Basis: It is expected that the side ejection system will work as intended after implementation of the selected solution.
Residual Consequence:	L	Residual Consequence Basis: Operation will proceed more efficiently.
Residual Risk Level:		

Additional Comments and Status

Comments: A solution is to be proposed in FY16. This is related to the general watch list item for movement of material through the plant.

ARIES Risk/Opportunity Identification Form Engineering Support

ID Number: E-7	Revision: 0	Last Evaluated: initial	Status: Inactive
Event Title: Corrective Maintenance Support			
Type (Risk/Opp): Risk	Contact: Troy Harden	Date Identified: 6/8/16	
Processes Affected: Engineering Support			

Initial Evaluation

Statement of Event: The event is unavailability of AET-5 support for program equipment maintenance.		
Likelihood:	L	Likelihood Basis: Engineering support for corrective maintenance is expected to remain the same as in the past.
Consequence:	L	Consequence Basis: Reduced corrective maintenance engineering support results in longer outages.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: N/A
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: Based on the assumption that staffing and budgets remain consistent with current levels

ARIES Risk/Opportunity Identification Form Engineering Support

ID Number: E-8	Revision: 0	Last Evaluated: initial	Status: Inactive
Event Title: Engineering Support for Configuration Management			
Type (Risk/Opp): Opp	Contact: Process Engineers	Date Identified: 6/8/16	
Processes Affected: Engineering Support			

Initial Evaluation

Statement of Event: The opportunity is to reduce potential program outage time by developing a systematic technical baseline.		
Likelihood:	M	Likelihood Basis: The need to replace or modify program equipment of the next 5 years is likely.
Consequence:	L	Consequence Basis: A standard set of technical baseline information would contribute to expediting program equipment replacement and maintenance.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: A standard set of technical baseline information to be maintained by the PrEs will make replacement, maintenance, and personnel development easier.
Implementation Cost:	0	Basis for Cost: Not known
Implementation Schedule:	0	Basis for Schedule: Not known

Residual Risk Evaluation

Statement of Residual Event: Savings on replacement, maintenance, and personnel turnover would be realized.		
Residual Likelihood:	L	Residual Likelihood Basis: Reduction in outage time is likely.
Residual Consequence:	L	Residual Consequence Basis: Residual consequences of equipment failure would be reduced.
Residual Risk Level:		

Additional Comments and Status

Comments: The main effort is development of a standard set of information for the PrEs to generate and maintain. The PrEs are taking the initiative for this.

ARIES Risk/Opportunity Identification Form Engineering Support

ID Number: E-9	Revision: 0	Last Evaluated: initial	Status: Inactive
Event Title: Engineering Support for Spare Parts			
Type (Risk/Opp): Opp	Contact: Process Engineers	Date Identified: 6/8/16	
Processes Affected: Engineering Support			

Initial Evaluation

Statement of Event: The opportunity is to reduce potential program equipment outage time by maintaining an effective spare parts inventory.		
Likelihood:	L	Likelihood Basis: Spares are being maintained, but a systematic approach to them has not been made.
Consequence:	M	Consequence Basis: A standard approach to spare parts would contribute to expediting program equipment replacement and maintenance.
Initial Risk Level:	L	

Handling Strategy

Handling Strategy:	Mitigate	Description: A standard set of technical spares will make replacement and maintenance easier.
Implementation Cost:	0	Basis for Cost: Not known
Implementation Schedule:	0	Basis for Schedule: Not known

Residual Risk Evaluation

Statement of Residual Event: Savings on replacement, maintenance, and personnel turnover would be realized.		
Residual Likelihood:	L	Residual Likelihood Basis: Reduction in outage time is likely.
Residual Consequence:	L	Residual Consequence Basis: Residual consequences of equipment failure would be reduced.
Residual Risk Level:		

Additional Comments and Status

Comments: The main effort is development of a standard set of spares for each piece of program equipment.

ARIES Risk/Opportunity Identification Form Engineering Support

ID Number: E-10	Revision: 0	Last Evaluated: initial	Status: Watch list
Event Title: Engineering Support for Water Ingress Prevention			
Type (Risk/Opp): Opp	Contact: Troy Harden	Date Identified: 11/1/16	
Processes Affected: Engineering Support			

Initial Evaluation

Statement of Event:
The potential for water ingress into GBs or safes from sprinklers due to a fire results in more restrictive criticality restrictions. Designs that prevent water ingress may allow less restrictive criticality limits and increased storage or processing capability

Likelihood:	M	Likelihood Basis: The more restrictive criticality limits are in effect. The reduction of water ingress is necessary for relaxing criticality restrictions.
Consequence:	M	Consequence Basis: Comments: Reduction in the amount of water that enters the GB during a fire allows a less restrictive criticality limit.
Initial Risk Level:	M	

Handling Strategy

Handling Strategy:	Mitigate	Description: Water shields to prevent fire suppression water from entering GBs are being designed and installed. Shelves added to Safes.
Implementation Cost:	0	Basis for Cost: Not known
Implementation Schedule:	0	Basis for Schedule: Not known

Residual Risk Evaluation

Statement of Residual Event:
Reduction in the water ingress for fires will allow a reduction in criticality restrictions.

Residual Likelihood:	L	Residual Likelihood Basis: The potential for water ingress into the GB during a fire will be reduced.
Residual Consequence:	L	Residual Consequence Basis: Less restrictive criticality requirements.
Residual Risk Level:		

Additional Comments and Status

Comments: The main effort is development and installation of water shields (rainhats) for gloveboxes, however prevention of water ingress into safes will likely allow increased safe storage.

ARIES Risk/Opportunity Identification Forms Program Management

ID Number: PM-1	Revision: 1	Last Evaluated: 2/15/17	Status: Watch list
Event Title: Increase in Production Rate			
Type (Risk/Opp): Risk	Contact: Program Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The event is a change in the program requirements that increases required production rate.		
Likelihood:	H	Likelihood Basis: An increase in requested production rate within the next 5 years is considered likely.
Consequence:	M	Consequence Basis: Anticipation of a request to increase production rate has little effect on current production rate. However, efforts to increase production rate are more significant, so the consequences are judged to be moderate. The details of the consequences depend on the nature of the requested increase which is "To Be Determined."
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The program planning includes implementation of the current mission within parameters that allow future mission expansion.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: It is likely that the program will be requested to increase production rate before the end of the next 5 years. The timing and nature of such an event is not well defined.		
Residual Likelihood:	H	Residual Likelihood Basis: Although considered likely, the decision is not entirely within program management control.
Residual Consequence:	M	Residual Consequence Basis: A request to increase production rate is judged to have a moderate effect on the current mission because it is likely to come near the end of the current 5-year risk evaluation and because current planning already includes maintaining the capability for some increased production.
Residual Risk Level:		

Additional Comments and Status

Comments:

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-2	Revision: 1	Last Evaluated: 2/15/17	Status: Active
Event Title: Change to ICD Requirements			
Type (Risk/Opp): Opp	Contact: **Technical** Project Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The opportunity is a change to the ICD requirements.		
Likelihood:	H	Likelihood Basis: It is likely that some relief in ICD requirements will be granted within the next 5 years.
Consequence:	L	Consequence Basis: The consequences would be low for the production rate, but could represent cost savings and savings in the time required for product acceptance.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Implement	Description: The program management activities include periodic review and revision to the ICD.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: ICD revisions are being made. Additional changes are likely, during the next 5 years, to provide some cost savings. However, it is not expected that such changes will have a significant effect on the rate of processing.		
Residual Likelihood:	H	Residual Likelihood Basis: Although considered likely, ICD revisions are not entirely within program management control.
Residual Consequence:	L	Residual Consequence Basis: ICD changes are not likely to have significant effects on the processes or process times.
Residual Risk Level:		

Additional Comments and Status

Comments: This evaluation is based on the expectation that ICD revisions are more likely to reduce requirements.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-3	Revision: 1	Last Evaluated: 2/15/17	Status: Closed
Event Title: Change to Project-specific Warehousing and Procurement Requirements			
Type (Risk/Opp): Opp	Contact: Program Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The event is removal of special program requirements for procurement and reverting to standard LANL quality programs.		
Likelihood:	L	Likelihood Basis: The likelihood of reaching this sort of agreement with the customer is considered low due to the effort required relative to the benefit.
Consequence:	L	Consequence Basis: The consequences would be low for the production rate, but could represent cost savings.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The program management activities include periodic review and revision to the ICD and customer audits from which agreements might be achieved with the customer on the appropriate quality levels for equipment procurement and storage.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: N/A		
Residual Likelihood:	L	Residual Likelihood Basis: This opportunity is unlikely unless an opportunity to achieve this agreement with the customer becomes available.
Residual Consequence:	L	Residual Consequence Basis: Such changes are not likely to have significant effects on the processes or process times, but may produce some long-term cost savings.
Residual Risk Level:		

Additional Comments and Status

Comments: It is judged that procurement requirements and some warehousing requirements that are imposed by the customer on equipment and components that are not parts of the delivered products may be revised to the levels as they would be in the LANL QA program. This opportunity will be realized through ICD changes, therefore it is included with PM-2.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-4	Revision: 1	Last Evaluated: 2/15/17	Status: Inactive
Event Title: Change to the MOX Fuel Facility (MFF) Oxide Requirements			
Type (Risk/Opp): Risk	Contact: TPM	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The event is changes to the oxide requirements that are more restrictive.		
Likelihood:	L	Likelihood Basis: Based on the current level of program uncertainty, it is considered unlikely that the oxide specifications might increase in the next 5 years.
Consequence:	M	Consequence Basis: The consequences are judged to be moderate because the nature of potential program changes is vague. PITD, Conversion, and Packaging would continue such that a change in the oxide requirements is not likely to have a significant effect on most of the processing.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: Program management participates in the decision processes that might affect the oxide requirements.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: It is likely that the some changes to the oxide requirements will be made during the next 5 years.		
Residual Likelihood:	L	Residual Likelihood Basis: Although considered unlikely, oxide requirements are not entirely within program management control.
Residual Consequence:	M	Residual Consequence Basis: Oxide requirement changes are not likely to have significant effects on the processes or process times but can significantly affect product acceptance.
Residual Risk Level:		

Additional Comments and Status

Comments: This change is similar to a change in the ICD except it is directly related to a more restrictive change in the required characteristics of the oxide. It is assumed that it is more likely that such changes would be in the direction of less rigor in the requirements for the oxide.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-5	Revision: 1	Last Evaluated: 2/15/17	Status: Watch list
Event Title: The Program Changes to Dilute & Dispose Instead of MOX Mission			
Type (Risk/Opp): Risk	Contact: Program Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The event is a change to the Pu disposition from MOX fuel to disposal.		
Likelihood:	H	Likelihood Basis: It is likely that the mission will change from preparation of oxide for use in fuel to preparation for disposal.
Consequence:	M	Consequence Basis: The consequences have been judged as moderate because it would continue to require PITD and oxide production along with some form of oxide processing and packaging.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The ARIES program maintains the current production rate and the ability to expand the production rate. The oxide production program activities include participation in the evaluation of options to MOX disposal.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: It is likely that the downblend and dispose option will be selected within the next 5 years. The details of how it will affect ARIES operations is unknown.		
Residual Likelihood:	H	**Residual Likelihood Basis:** The program participates in the decision process for down blending. However, its participation does not directly affect the likelihood of the decision. Therefore, the likelihood is considered as unaffected.
Residual Consequence:	M	**Residual Consequence Basis:** The possibility of a change in the mission is not an assumption to the risk assessment. However, operational decisions during the next 5 years will consider the likelihood of a change to the mission.
Residual Risk Level:		

Additional Comments and Status

Comments: The expected change to the mission is similar to changes to the ICD, production rate, and oxide requirements. They are likely, but details are not known. Therefore, operations during the 5-year risk evaluation period will take these likelihoods into consideration.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-6	Revision: 1	Last Evaluated: 2/15/17	Status: Watch list
Event Title: Change to the Vault Storage Space for ARIES Material			
Type (Risk/Opp): Risk	Contact: Program Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The event is loss of designated storage in the vault.		
Likelihood:	M	Likelihood Basis: Sufficient storage space in the vault has been reserved based on the anticipated production rate over the next 5 years. Although there is competition for storage space from other programs, the likelihood of losing the reserved space is considered moderate.
Consequence:	H	Consequence Basis: Should storage space become unavailable, processing would likely stop. Therefore, the consequences are considered high.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: Other than defending the allotted storage space, there is little that can be done to protect it. The options for increasing vault storage space are being assessed in FY17. FY18 is expected to include initial design for increasing vault storage.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: N/A		
Residual Likelihood:	L	Residual Likelihood Basis: The likelihood of insufficient vault storage will be reduced if the anticipated mitigation is achieved.
Residual Consequence:	H	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: This risk is being mitigated. However, it is being kept on the watch list because vault storage is a primary issue for many programs. This item is part of a general watch list item for storage and movement of material through the plant.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-7	Revision: 1	Last Evaluated: 2/15/17	Status: Watch list
Event Title: Lack of In-line Storage			
Type (Risk/Opp): Risk	Contact: Program Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The risk is restrictions to in-line storage.		
Likelihood:	H	Likelihood Basis: At the resumption of processing, in-line storage has become more difficult due to new criticality limits. Therefore, the ability to store in-process material in the GB has been be reduced.
Consequence:	M	Consequence Basis: Lack of in-line storage requires a closer link between the various processes that can reduce productivity.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: Provision of inline storage Options for increasing in line storage are being assessed in FY17. Implementation is anticipated to begin in FY 18.
Implementation Cost:	0	Basis for Cost: TBD
Implementation Schedule:	0	Basis for Schedule: TBD

Residual Risk Evaluation

Statement of Residual Event: Provision of in-line storage will allow more independence between the various process modules. Independent module operations will allow each module to maximize its production rate and to optimize its equipment maintenance and out-of-service times.		
Residual Likelihood:	L	Residual Likelihood Basis: It is likely that sufficient in-line storage will allow each module to operate at rates that approach its capacity.
Residual Consequence:	L	Residual Consequence Basis: Increased in-line storage will not affect the reliability or operation of the modules, but will increase their opportunities to operate.
Residual Risk Level:		

Additional Comments and Status

Comments: It is likely that production rates can be achieved with the more restrictive criticality limits and without more in-line storage. However, increased in-line storage will allow increased production rates, with the current equipment, that approaches the production rate of the most restrictive module. Therefore, full mitigation also implements an opportunity. This item is part of a general watch list item for storage and movement of material through the plant.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-8	Revision: 1	Last Evaluated:2/15/17	Status: Active
Event Title: Safes			
Type (Risk/Opp): Opp	Contact: Program Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The opportunity is the provision of safes for storage of items at each end of the processing stream. It includes seismically supporting existing safes, modifications to safe shelving, and is connected to criticality analyses for storage of SNM in safes.		
Likelihood:	M	Likelihood Basis: Additional safes and seismic anchoring of safes is ongoing. Therefore, it is considered moderately likely that additional safes will become available
Consequence:	M	Consequence Basis: The safes provide stability of operations at the beginning and at the end of the processing.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Implement	Description: CSEDs are being developed in FY17, to support storage in safes. Installation of more shelves in the safes, and completion of seismic anchoring are on-going projects for FY 17 and into FY 18.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: N/A		
Residual Likelihood:	L	Residual Likelihood Basis: The benefit of expanded safe storage will be realized when the safes are installed and anchored.
Residual Consequence:	L	Residual Consequence Basis**:** Increased safe storage will stabilize the beginning and end of the processing line.
Residual Risk Level:		

Additional Comments and Status

Comments: Additional safes helps to decouple the various processes from slowdowns in shipping and post-packaging activities. Safes are complimentary to additional bag-out capability. Criticality issues are addressed with risk PM-22. Shipping and receiving storage is part of S-1. In-line storage is addressed with PM-7. This item is part of a general watch list item for storage and movement of material through the plant.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-9	Revision: 1	Last Evaluated: 2/15/17	Status: Closed
Event Title: Seismic Supports for Safes			
Type (Risk/Opp): Risk	Contact: Process Engineers	Date Identified: 6/8/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The event is failure to seismically anchor safes.		
Likelihood:	L	Likelihood Basis: Seismic supports are being added for safes.
Consequence:	M	Consequence Basis: The consequences of failure to seismically support the safes is that they cannot be used.
Initial Risk Level:	L	

Handling Strategy

Handling Strategy:	Mitigate	Description: All but two safes have been seismically anchored.
Implementation Cost:	0	Basis for Cost: Not known
Implementation Schedule:	0	Basis for Schedule: Not known

Residual Risk Evaluation

Statement of Residual Event .		
Residual Likelihood:	L	Residual Likelihood Basis: The successful completion of the seismic anchoring program will resolve this concern.
Residual Consequence:	L	Residual Consequence Basis: Completion of the seismic anchoring is expected to return the availability of safes to its former level.
Residual Risk Level:		

Additional Comments and Status

Comments: Seismic anchoring of safes is currently being performed. This item is being closed, and residual activities are included with PM-8. This item is part of a general watch list item for storage and movement of material through the plant.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-10	Revision: 1	Last Evaluated: 2/15/17	Status: Inactive
Event Title: Funding Uncertainty			
Type (Risk/Opp): Risk	Contact: Program Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The event is funding uncertainty particularly due to continuing resolutions.		
Likelihood:	H	Likelihood Basis: Even if annual funding is maintained, the possibility of funding uncertainties due to circumstances such as continuing resolutions is likely. Therefore, the likelihood of funding uncertainty is considered to be high.
Consequence:	M	Consequence Basis: Funding uncertainty can prevent Timely investments in necessary equipment and personnel. The consequences of funding uncertainties are mainly on sustainability of operations. Therefore, the consequences are judged to be moderate.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Transfer	Description: The program management and work package management processes are in place to respond to uncertainties in funding. Transfer to NNSA.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: N/A		
Residual Likelihood:	H	**Residual Likelihood Basis:** Each FY has some funding uncertainty.
Residual Consequence:	M	**Residual Consequence Basis:** The consequences of funding uncertainties are spread over the 5-year risk assessment period.
Residual Risk Level:		

Additional Comments and Status

Comments: Funding uncertainties are a reality of every FY. It is understood that fundamental changes in funding will be accompanied by fundamental changes to the mission. Therefore, while individual FY work will be at moderate risk for funding uncertainties, it is accepted that the overall work for the 5-year period of risk assessment can be achieved.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-11	Revision: 1	Last Evaluated: 2/15/17	Status: Closed
Event Title: Readiness Assessments			
Type (Risk/Opp): Risk	Contact: Program Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The event is that the results of readiness assessments cause a delay in processing. Including Readiness for DMO-3		
Likelihood:	L	Likelihood Basis: Most modules except for DMO-3 are past their readiness assessments. Certain modifications or new equipment installations may be subject to a readiness assessment. There is a slight possibility that facility assessments might delay or interrupt facility availability. However, all of these are judged to be within the normally expected conditions for operation. Therefore, the likelihood of processing being stopped as a result of readiness assessment is considered to be low.
Consequence:	L	Consequence Basis: Most readiness assessment findings are resolved with minor effects on processing. Therefore, the consequences of assessment findings are considered to be low. DMO-3 readiness is scheduled for FY-17.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: N/A
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: N/A		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: DMO-3 readiness assessment is being addressed in FY 17 other readiness activities are normal parts of equipment installation.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-12	Revision: 2	Last Evaluated: 4/13/17	Status: Watch list
Event Title: Change in PF-4 Room Accessibility and space competition			
Type (Risk/Opp): Risk	Contact: Operations Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The event is that room activities such as space competition, construction or contamination make access to an ARIES module unavailable due to factors outside program control.		
Likelihood:	M	Likelihood Basis: Other programs will be reconfiguring PF-4 over the next 5 years for other missions. Other programs share the same rooms as oxide production modules. In some cases use of oxide production equipment is requested when other programs have special needs. It is likely that some of the rooms or equipment used for ARIES will be affected. The likelihood of causing delays or periods of room unavailability is considered moderate.
Consequence:	M	Consequence Basis: The inability to access ARIES rooms or equipment due to periods of construction, or demands from other programs will result in pauses in processing. The effect on the ability to meet ARIES objectives is considered to be moderate mainly due to the low oxide production rate for the next 5 years.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The flexibility allowed by the current production goals allows the ability to work around modest room unavailability due to construction projects for other missions.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: N/A		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	M	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: An increase in production rate will result in a significant increase in the consequences of room unavailability. Safes, inline storage, improved CSEDs all combine to reduce this risk. This is on the watch list because advanced planning can help mitigate the effects of room or equipment unavailability.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-13	Revision: 1	Last Evaluated: 2/15/17	Status: Watch list
Event Title: Pause in PF-4 Operations			
Type (Risk/Opp): Risk	Contact: Operations Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements, implemented through plant operations.			

Initial Evaluation

Statement of Event: The event is a facility operational pause Outside program control that prohibits ARIES work.		
Likelihood:	M	Likelihood Basis: The pause due to criticality has been long, but such pauses have been rare. As the facility returns to full operation, the potential for further pauses is less certain; therefore, the likelihood has been judged to be moderate
Consequence:	M	Consequence Basis: A pause in PF-4 operations stops ARIES operations. The expectation is that a pause will not be as severe as the recent pause and that its effect on ARIES production will be moderate due to the flexibility allowed by the low production rate.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The possibility of a pause is outside the scope of control of the ARIES program. The risk is acceptable due to the low production rates.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: N/A		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	M	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: An increase in production rate will result in a significant increase in the consequences of a pause in facility operations.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-14	Revision: 1	Last Evaluated: 2/15/17	Status: Watch list
Event Title: LANL Contract Change			
Type (Risk/Opp): Risk	Contact: Program Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The event is the LANL contract change in 2018, and the potential effect on productivity and personnel.		
Likelihood:	H	Likelihood Basis: The contract change is very likely to occur.
Consequence:	M	Consequence Basis: Direct consequences are not normally expected, but indirect consequences associated with a contract change are expected to include higher labor rates, loss of staff due to changes in benefits, and possible changes in overhead rates. Therefore, the consequences are judged to be moderate.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The program has little control or influence on the consequences of the contract change.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: N/A		
Residual Likelihood:	H	Residual Likelihood Basis:
Residual Consequence:	M	Residual Consequence Basis: Previous contract changes were associated with personnel turnover and temporary reduction in productivity.
Residual Risk Level:		

Additional Comments and Status

Comments: It is recognized that general uncertainty associated with the contract change will affect productivity. Early retirements may also be associated with the contract change.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-15	Revision: 1	Last Evaluated: 2/15/17	Status: Watch list
Event Title: Increases in Regulatory Requirements			
Type (Risk/Opp): Risk	Contact: Program Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The event is a change in a regulatory requirement such as the 9975 or 9977 SARP for shipping containers, dose limits for workers, security, safety or other DOE orders..		
Likelihood:	M	Likelihood Basis: It is reasonable to expect some changes to regulatory requirements or DOE orders within the next 5 years.
Consequence:	M	Consequence Basis: Regulatory changes can have a wide range of effects. Therefore, the consequences were judged to be moderate.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: Regulatory requirements are not within the Program's control.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: N/A		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	M	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments:

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-16 see PM-15	Revision: 1	Last Evaluated: 2/15/17	Status: Closed
Event Title: Changes to Allowable Doses for Workers			
Type (Risk/Opp): Risk	Contact: Program Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The event is a reduction in allowed doses.		
Likelihood:	M	Likelihood Basis: A reduction in the allowable doses for workers is under consideration; the likelihood of having the dose limits reduced is considered moderate.
Consequence:	M	Consequence Basis: The consequences of lower dose limits will not directly affect process performance, so they are judged to be moderate.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The current dose limits have had little effect on operation. It is expected that effects can be accommodated over time.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: N/A		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	M	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: Because normal practice is in accordance with ALARA principles, it is likely that any dose limit reductions will be able to be met with minimum effects on production. This item is encompassed in PM-15.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-17	Revision: 1	Last Evaluated: 2/15/17	Status: Watch list
Event Title: Changes to Waste Management Costs			
Type (Risk/Opp): Risk	Contact: Program Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The event is an increase in program costs due to changes in how waste management is funded.		
Likelihood:	M	Likelihood Basis: The likelihood is unknown but judged to be moderate as a separate environmental waste management organization is being implemented.
Consequence:	M	Consequence Basis: The financing structure of the revised organization has not been developed, so the consequences are judged to be moderate.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The change in the organization for handling waste is not within the programs scope. Once developed the program will be able to address the effects.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: N/A		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	M	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: Costs may increase when TWF comes on line.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-18	Revision: 1	Last Evaluated: 2/15/17	Status: Active
Event Title: Change to the Use of Electronic Datasheets			
Type (Risk/Opp): Opp	Contact: Program Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The opportunity is a transition to the use of electronic data sheets instead of paper data sheets.		
Likelihood:	M	Likelihood Basis: The change is currently in the work packages and is being developed. It is judged as moderately likely because it is in the development stage.
Consequence:	M	Consequence Basis: The electronic data sheets do not alter the processing of material, only the recording of data, therefore the consequences are judged to be moderate.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Implement	Description: The work for changing to electronic datasheets has already been initiated.
Implementation Cost:	0	Basis for Cost: Already within the scope of approved work
Implementation Schedule:	0	Basis for Schedule: Initial testing and deployment in FY17

Residual Risk Evaluation

Statement of Residual Event: N/A		
Residual Likelihood:	M	Residual Likelihood Basis: The initial use of electronic data sheets for some processes is likely to occur in FY17.
Residual Consequence:	M	Residual Consequence Basis: When fully initiated, they are expected to result in fewer non-conformances and quicker and less expensive product acceptance.
Residual Risk Level:		

Additional Comments and Status

Comments: Implementation for all processes may extend to subsequent FYs.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-19	Revision: 1	Last Evaluated: 2/15/17	Status: Watch list
Event Title: Changes to Policies for Conduct of Maintenance, Operations, Training, etc.			
Type (Risk/Opp): Risk	Contact: TPM	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The event is changes in "Conduct Of" policies, thus requiring changes to procedures.		
Likelihood:	M	Likelihood Basis: Policies for major activities like engineering, maintenance, and operations are being developed or changed. Therefore, it is judged to be moderately likely that procedural changes will result.
Consequence:	L	Consequence Basis: Policy changes are not unusual and the consequences are normally accounted for in the routine planning. A significant change might affect schedule. Therefore, the consequences have been judged to be low.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The risk is accepted on the basis that such policy changes are a normal part of facility work.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: N/A		
Residual Likelihood:	M	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: Changes to “Conduct of” policies are normally implemented routinely as procedures are revised. In some cases they may require procedure change, but seldom require interruption of already approved work.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-20 see PM-15	Revision: 1	Last Evaluated: 2/15/17	Status: Closed
Event Title: Changes to MC&A			
Type (Risk/Opp): Risk	Contact: Program Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The event is that MC&A requirements affect processes.		
Likelihood:	L	Likelihood Basis: Because MC&A requirements have been in force for a long time, it is not likely that a significant change in the MC&A implementation will occur.
Consequence:	L	Consequence Basis: Normally changes in MC&A requirements do not affect the processing procedures, so the consequences of potential MC&A changes are low.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: N/A
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: N/A		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: This risk is encompassed in PM-15.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-21	Revision: 2	Last Evaluated: 3/22/17	Status: Watch list
Event Title: Relief from MC&A Restrictions (Inventory frequency)			
Type (Risk/Opp): Opp	Contact: Operations Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The opportunity is an increase in the equipment availability		
Likelihood:	M	Likelihood Basis: The likelihood of getting permission from MC&A for an increase in time between inventories is moderate.
Consequence:	M	Consequence Basis: During low production the consequences are modest. but during higher production scenarios or when equipment is out of service, changing inventory frequency to bi-annual instead of every 8 weeks can be significant.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Implement	Description: A request to MC&A for a change in the frequency of inventorieswill be initiated.
Implementation Cost:	0	Basis for Cost: TBD
Implementation Schedule:	0	Basis for Schedule: TBD

Residual Risk Evaluation

Statement of Residual Event: N/A		
Residual Likelihood:	L	Residual Likelihood Basis: If approved, the decrease in frequency of inventories will result in an increase in system availability.
Residual Consequence:	L	Residual Consequence Basis: For low production rates, the consequences will be low.
Residual Risk Level:		

Additional Comments and Status

Comments: Previously, MC&A approved the mixing of oxide from muffle furnaces and DMO operations, It is now proposed to change the time between inventories from every two months to bi-annual. This opportunity will be more beneficial as the production rate is increased.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-22	Revision: 1	Last Evaluated: 2/15/17	Status: Active
Event Title: Reduced Processing Due to New Criticality Limits on FMOs			
Type (Risk/Opp): Risk	Contact: Program Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The event is that new criticality limits reduce production rate, and analyses to restore limits are delayed due to low priority.		
Likelihood:	H	Likelihood Basis: The new criticality limits will be in effect when processing resumes, therefore the likelihood is high.
Consequence:	L	Consequence Basis: The current judgment is that the low production rates can be achieved with the more restrictive criticality limits. Therefore, the consequences were judged to be low.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	**Description:** New CSEDs with higher limits are being actively pursued. This continues in FY 17 and beyond, as resources allow.
Implementation Cost:	0	**Basis for Cost:** FY 17 work package is $400K.
Implementation Schedule:	0	**Basis for Schedule:** N/A

Residual Risk Evaluation

Statement of Residual Event: N/A		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: This risk (consequence portion) will become more apparent, after resumption of processing using the new criticality limits.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-23 see PM-22	Revision: 1	Last Evaluated: 2/15/17	Status: Closed see PM-22
Event Title: Criticality Analyses			
Type (Risk/Opp): Opp	Contact: Program Manager	Date Identified: 6/27/16	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The opportunity is that criticality analyses allow processing with more flexible limits.		
Likelihood:	M	Likelihood Basis: Revised criticality analysis is on the schedule and is moderately likely to be successful.
Consequence:	M	Consequence Basis: It is expected that the revised analyses will allow removal of the more restrictive criticality limits and a return to the material handing limits that existed during the last period of processing.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Implement	Description: New criticality analyses for some ARIES processes are being performed.
Implementation Cost:	0	Basis for Cost: Once the analyses are complete, the implementation will be through the criticality safety program.
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: N/A		
Residual Likelihood:	L	Residual Likelihood Basis: It is considered likely that the criticality analyses will support a return to previously allowed material limits.
Residual Consequence:	L	Residual Consequence Basis: A change in the allowed material processing limits will increase production rates and flexibility.
Residual Risk Level:		

Additional Comments and Status

Comments: This opportunity will become more apparent after resumption of processing using the new criticality limits. The importance of reverting to the previously approved limits will be more significant for increased production rates. This item is encompassed by item PM-22.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-24 see PM22	Revision: 1	Last Evaluated:2/15/17	Status: Closed see PM-22
Event Title: New CSEDs for Processes			
Type (Risk/Opp): Risk	Contact: Program Manager	Date Identified: 11/01/16	
Processes Affected: Processes that handle fissile material (most processes)			

Initial Evaluation

Statement of Event: The risk is that the level III CSEDs will not be issued in a timely manner. A level III CSED is required to exit the restrictions that are currently applied through the ESS.		
Likelihood:	High	Likelihood Basis: There are insufficient resources to allow issuance of all required CSEDs.
Consequence:	Moderate	Consequence Basis: The ESS allows minimal operation under severe criticality restrictions. An exit from the without a level III CSED is not likely so the ESS limits will continue. This is judged to be a moderate consequence since the current production rate is small.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description:
Implementation Cost:		Basis for Cost: N/A
Implementation Schedule:		Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	High	Residual Likelihood Basis: Unchanged
Residual Consequence:	Moderate	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: Encompassed in item PM-22.

ARIES Risk/Opportunity Identification Form Program Management

ID Number: PM-25	Revision: 1	Last Evaluated: 2/15/17	Status: Watch list
Event Title: Uncertainty in external shipment dates for oxide product			
Type (Risk/Opp): Risk	Contact: Program Manager	Date Identified: 1/30/17	
Processes Affected: Shipping			

Initial Evaluation

Statement of Event: Current program requirements state that LANL will be able to ship oxide to SRNS no later than 2023, but this is contingent on WIPP operations and other factors that are unpredictable.		
Likelihood:	Moderate	Likelihood Basis**:** This likelihood is designated moderate due to the large number of non-LANL controlled conditions that will affect the ability of SRNS to accept shipments from LANL.
Consequence:	Moderate	Consequence Basis: The inability to ship is equivalent to the inability to complete the mission. However, if vault storage, as planned, does not change it is likely that the program can continue to operate until 2027.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Transfer	Description:
Implementation Cost:		Basis for Cost: N/A
Implementation Schedule:		Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	Moderate	Residual Likelihood Basis: Unchanged
Residual Consequence:	Moderate	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments:

ARIES Risk/Opportunity Identification Forms Program Management

ID Number: PM-26	Revision: 1	Last Evaluated: 2/15/17	Status: Watch list
Event Title: Change to Production Rate (increase)			
Type (Risk/Opp): Opp	Contact: Program Manager	Date Identified: 1/30/17	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The opportunity is to maximize the production rate by utilization of equipment excess capacity, at the current funding level.		
Likelihood:	L	Likelihood Basis: The capability maintenance production rate does not fully utilize equipment capacity. An increase in production rate is likely to be possible with planned staffing.
Consequence:	M	Consequence Basis: The benefit is increased flexibility for future risks, and shorter lifecycles. An increase production rate would affect storage provisions and usage factors but can be handled within the ability to ship to SRS. The benefits are better equipment usage factors and expanded staffing capability for future program expansion. If available storage is filled then later years might be restricted to maintenance.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: Early maximization of production provides margin to unexpected delays in production later in the program life. Implementation of the opportunity is waiting on resolution of storage issues.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: It is likely that the program will be requested to increase production rate before the end of the next 5 years. The timing and nature of such an event is not well defined. Implementation of higher production rates earlier provides a margin to unexpected changes to planned production rates.		
Residual Likelihood:	L	Residual Likelihood Basis: Maximizing equipment utilization factors will have little effect on the current planned production over the next 5 years except to exceed scheduled deliveries.
Residual Consequence:	M	Residual Consequence Basis: If the capability production rate is exceeded without the capability to ship to SRS then additional storage will need to be found.
Residual Risk Level:		

Additional Comments and Status

Comments: This opportunity is related to the risk described in PM-1

ARIES Risk/Opportunity Identification Forms Program Management

ID Number: PM-27	Revision: 1	Last Evaluated: 2/15/17	Status: Watch list
Event Title: U Electro-decon			
Type (Risk/Opp): Risk	Contact: Program Manager	Date Identified: 1/30/17	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: Currently only non-U items are being processed per the 2 MT mission. If the mission changes the U electro-decon system needs readiness review.		
Likelihood:	H	Likelihood Basis: The capability maintenance production rate does not include Uranium processing. Changes to the mission could include U processing, although the disposition path is unclear.
Consequence:	M	Consequence Basis: Mission production rates can be achieved but mission purpose is affected.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: A new PrE has been hired for the uranium process. Support for readiness in FY 18 is anticipated.
Implementation Cost:	0	Basis for Cost: Costs are shared with the MR&R program.
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: .		
Residual Likelihood:	L	Residual Likelihood Basis: This capability is expected to be maintained for the capability production period.
Residual Consequence:	L	Residual Consequence Basis:
Residual Risk Level:		

Additional Comments and Status

Comments:

ARIES Risk/Opportunity Identification Forms Program Management

ID Number: PM-28	Revision: 1	Last Evaluated: 2/15/17	Status: Watch list
Event Title: Change TRU Waste Management			
Type (Risk/Opp): Risk	Contact: Program Manager	Date Identified: 1/30/17	
Processes Affected: Program Management Requirements			

Initial Evaluation

Statement of Event: The event is a curtailment of TRU waste generation due to lack of storage space pending operation of the TWF. Such an event stops waste producing processes.		
Likelihood:	M	Likelihood Basis: The likelihood of delays in operation of the TWF is considered to be moderate.
Consequence:	M	Consequence Basis: The consequences are considered to be moderate because delays to the TWF are likely to be small relative to the 5 year span of the capability plan.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: Early maximization of production provides margin to unexpected delays in production due to a delay in TWF.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	M	Residual Likelihood Basis: Maximizing production helps to mitigate this type of risk that is out of the projects ability to control.
Residual Consequence:	M	Residual Consequence Basis:
Residual Risk Level:		

Additional Comments and Status

Comments: This risk is related to the risk described in PM-12 & 13

ARIES Risk/Opportunity Identification Forms Program Management

ID Number: PM-29	Revision: 1	Last Evaluated: 2/22/17	Status: Watch list
Event Title: Personnel Availability			
Type (Risk/Opp): Risk	Contact: NCO and MET Group Leaders	Date Identified: 2/22/17	
Processes Affected: ARIES Processes			

Initial Evaluation

Statement of Event: The event is loss of skilled and certified personnel due to aging workforce, retirement, lack of retention.		
Likelihood:	H	Likelihood Basis: Based on the current age of the work force and normal retentions there will be loss of experienced personnel during the next 5 years.
Consequence:	M	Consequence Basis: The loss of experienced personnel slows production and increases cost.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: Current funding supports maintaining the current work force but does not address the additional costs of new or replacement personnel. Fully fund increased staffing in anticipation of retirements. The staffing plan accounts for replacement of expected retirements but does not address cross training to account for unexpected loss of personnel, and it is not fully funded.
Implementation Cost:	$2-$3 M/yr0	Basis for Cost: $2-$3M per year
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event:		
Residual Likelihood:	M	Residual Likelihood Basis: Maximizing production helps to mitigate this type of risk that is out of the project's ability to control.
Residual Consequence:	L	Residual Consequence Basis:
Residual Risk Level:		

Additional Comments and Status

Comments: This risk was identified by most processes and is being combined into this single item. This issue is complicated by the long lead times associated with training and security clearances. (up to two years). Retention is also complicated by low production rates, which requires additional activities to promote staff retention, and maintain certifications for highly trained personnel. Current staffing level is not meeting the capability maintenance level.

ARIES Risk/Opportunity Identification Forms Pu Conversion Muffle Furnace

ID Number: M-1	Revision: 1	Last Evaluated: 2/15/17	Status: Inactive
Event Title: Carbolite Furnace Operation			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/1/16	
Processes Affected: Muffle Furnace			

Initial Evaluation

Statement of Event: The event is the failure of a Carbolite furnace.		
Likelihood:	M	Likelihood Basis: Carbolite furnaces are reliable, but this likelihood was assigned as moderate due to lack of experience in this application.
Consequence:	L	Consequence Basis: The effect on overall production is considered low because there are multiple furnaces.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description:
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains moderate.		
Residual Likelihood:	M	Residual Likelihood Basis: N/A
Residual Consequence:	L	Residual Consequence Basis: N/A
Residual Risk Level:		

Additional Comments and Status

Comments: There are 3 Carbolite furnaces; failure of one would only affect the rate of production. At the current production rate, the loss of a furnace is not likely to affect the ability to meet production requirements.

ARIES Risk/Opportunity Identification Form Pu Conversion Muffle Furnace

ID Number: M-2	Revision: 1	Last Evaluated: 2/15/17	Status: Active
Event Title: Dual Furnace Control System			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/1/16	
Processes Affected: Muffle Furnace			

Initial Evaluation

Statement of Event: The event is the failure of the Dual Furnace Control system for the Carbolite furnaces.		
Likelihood:	M	Likelihood Basis: The dual furnace control system is a legacy system that indicates good past performance but increased likelihood of failure due to age.
Consequence:	M	Consequence Basis: The consequences are judged to be moderate because the control system affects two of the three Carbolite furnaces.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: The risk is acceptable due to the availability of the third furnace, the other oxidation systems (such as DMO), and the low production rate. The dual furnace control system is being replaced in FY 17. The new system will serve all three furnaces.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains moderate.		
Residual Likelihood:	L	Residual Likelihood Basis: N/A
Residual Consequence:	L	Residual Consequence Basis: N/A
Residual Risk Level:		

Additional Comments and Status

Comments: There are 3 Carbolite (muffle) furnaces; failure of the dual furnace control system would affect two of them. At the current production rate and with the availability of DMO, the loss of two Carbolite furnaces is not likely to affect the ability to meet production requirements.

ARIES Risk/Opportunity Identification Form Pu Conversion Muffle Furnace

ID Number: M-3	Revision: 1	Last Evaluated:2/15/17	Status: Active
Event Title: Single Furnace Control System			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/1/16	
Processes Affected: Muffle Furnace			

Initial Evaluation

Statement of Event: The event is the failure of the single furnace control system for the Carbolite furnaces.		
Likelihood:	L	Likelihood Basis: The single furnace control system is a unique to only one Carbolite furnace.
Consequence:	L	Consequence Basis: The consequences are judged to be low because the control system affects only one of the three Carbolite furnaces.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Mitigate	Description: The risk is acceptable due to the availability of the other two furnace, the other oxidation systems (such as DMO), and the low production rate. The single furnace control system is being replaced in FY-17.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains moderate.		
Residual Likelihood:	L	Residual Likelihood Basis: N/A
Residual Consequence:	L	Residual Consequence Basis: N/A
Residual Risk Level:		

Additional Comments and Status

Comments: There are 3 Carbolite (muffle) furnaces; failure of the single furnace control system would affect only one of them. At the current production rate and with the availability of DMO, the loss of a furnace is not likely to affect the ability to meet production requirements. See M-2.

ARIES Risk/Opportunity Identification Form Pu Conversion Muffle Furnace

ID Number: M-4	Revision: 1	Last Evaluated: 2/15/17	Status: Inactive
Event Title: MR&R Shared Furnace			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/1/16	
Processes Affected: Muffle Furnace			

Initial Evaluation

Statement of Event: The event is that one of the ARIES muffle furnaces is necessary for a different mission.		
Likelihood:	H	Likelihood Basis: Other missions require one of the Carbolite furnaces from time to time.
Consequence:	L	Consequence Basis: The consequences are judged to be low because there are three furnaces. If the MR&R mission expanded to require one furnace full-time, the capacity of the other two is sufficient for the current ARIES mission.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The risk is acceptable due to the availability of the other two furnaces. The ARIES procedures are being revised to allow use of all three furnaces for production.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains moderate.		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: There are 3 Carbolite (muffle) furnaces. Assignment of one to another mission, at the current production rate, is not likely to affect the ability to meet production requirements.

ARIES Risk/Opportunity Identification Form Pu Conversion Muffle Furnace

ID Number: M-5	Revision: 1	Last Evaluated: 2/15/17	Status: Closed
Event Title: Control System Upgrade			
Type (Risk/Opp): Risk	Contact: Process Engineer	Date Identified: 6/1/16	
Processes Affected: Muffle Furnace			

Initial Evaluation

Statement of Event: The event is that the control system upgrade is not completed as scheduled.		
Likelihood:	L	Likelihood Basis: The upgrade is on schedule for FY16.
Consequence:	L	Consequence Basis: The current control system is operable but out of date. A short delay in out year production might occur if it is installed after resumption of operations.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Accept	Description: The risk is acceptable due to the availability of the other two furnaces.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains moderate.		
Residual Likelihood:	L	Residual Likelihood Basis: Unchanged
Residual Consequence:	L	Residual Consequence Basis: Unchanged
Residual Risk Level:		

Additional Comments and Status

Comments: The consequences of a delay in the installation of the upgraded control system are low because the current production rates are low and the availability of alternate production systems (DMO). Encompassed by M-2 and M-3.

ARIES Risk/Opportunity Identification Form Pu Conversion Muffle Furnace

ID Number: M-6	Revision: 1	Last Evaluated: 2/15/17	Status: Closed
Event Title: Size Reduction			
Type (Risk/Opp): Opp	Contact: Process Engineer	Date Identified: 6/1/16	
Processes Affected: Muffle Furnace			

Initial Evaluation

Statement of Event: The event is that input material does not allow full furnace capacity.		
Likelihood:	H	Likelihood Basis: The current condition is that crude size-reduction methods reduce the available production rate.
Consequence:	L	Consequence Basis: The consequences of the current condition do not prevent achievement of production rates. However, the opportunity is for increased production rate for little additional effort.
Initial Risk Level:		

Handling Strategy

Handling Strategy:	Implement	Description: Provide for mechanical assisted size reduction to increase the amount of material in each furnace run.
Implementation Cost:	0	Basis for Cost: N/A
Implementation Schedule:	0	Basis for Schedule: N/A

Residual Risk Evaluation

Statement of Residual Event: The residual risk remains moderate.		
Residual Likelihood:	L	Residual Likelihood Basis: If the opportunity is realized, then likelihood of further opportunity is low.
Residual Consequence:	L	Residual Consequence Basis: The limited production rate will be unaffected but potential for a rate increase will be realized.
Residual Risk Level:		

Additional Comments and Status

Comments: The existing furnaces can meet production rates without assisted size reduction. However, improved size reduction can increase production rate or reduce the number of necessary furnace operations. Full utilization of the furnaces is currently possible.