LA-UR-23-24217

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Title:	Workshop on Establishing and Operating a National Nuclear Security Support Centre Hypothetical Scenario: “Centralia Nuclear Security Support Centre Technical Support Plan”
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Intended for:	This is intended to support International Atomic Energy Agency workshops for Member States in establishing and operating national nuclear security support centres, as part of hypothetical scenario-based exercises for workshop participants, based on the fictitious country "Centralia." Report
Issued:	2023-04-21

Workshop on Establishing and Operating a National Nuclear Security Support Centre Hypothetical Scenario: "Centralia Nuclear Security Support Centre Technical Support Plan"

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NEN-3

CENTRALIA NUCLEAR SECURITY SUPPORT CENTRE
TECHNICAL SUPPORT PLAN

Approved by:	Title	Signature
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1. TECHNICAL SUPPORT PROGRAMME

1.1 PURPOSE

This plan outlines the systemic and coordinated management of the CNSSC technical support programme. In accordance with the CNSSC Strategy Implementation Plan and Memoranda of Understanding among stakeholders, Centralia Border Guards (CBG) and Centralia Nuclear Energy Agency (CNEA) will lead the effort to develop standardized approach to technical support and will provide technical support to the following CNSSC stakeholders:

- CBG
- CNEA
- Centralia National Police (CNP)
- Centralia Coast Guard (CCG)
- CentrAtom/Centralia Nuclear Power Plant (CNPP).

1.2 SITE LAYOUT AND EQUIPMENT LOCATIONS

The equipment, laboratories, instrumentation, and staff which support the CNSSC technical support programme are primarily located at two facilities in Capital City: the CBG Academy and CNEA Headquarters.

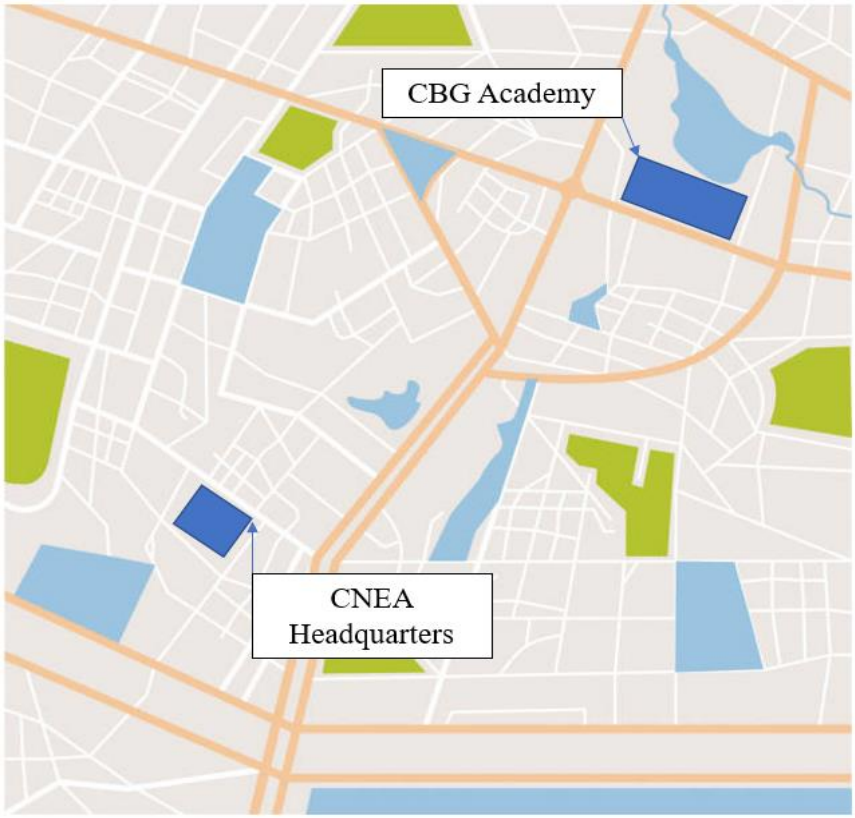

Fig 1, CNSSC Technical Support Sites

1.2.1 CBG Academy

CBG owns and operates both fixed and handheld radiation detection systems in place at the country's three largest land border points of entry. CBG has a CBRN team that provides training for FLO on carrying out duties for detection and responding to material out of regulatory control, including for operation and maintenance of radiation detection equipment. CBG has developed a mature program for internal preventive maintenance of radiation detection equipment, based out of the CBG Academy, and conducts limited corrective maintenance for equipment that is past warranty. The Academy has four classrooms with max capacity of 30 persons per room. One conference room with a one large table that has a max capacity of 18 persons and an auditorium with fixed desk seating with max capacity of 100 persons. There is an exercise area outside the training facility where hands-on training with detection equipment and instruments are performed, including at the Radiation Portal Monitor (RPM) Test Lane (RPM Alley). The main spare parts inventory and technical support laboratory is also located in CBG Academy main building, along with many of the necessary special tools, test equipment, and a full complement of radioactive check sources.

1.2.2 CNEA

CNEA conducts training on security of radioactive sources and provides expert support, both internally and to external stakeholders and has classrooms and laboratories available and will provide technical support on PPS maintenance. As a part of the process to develop CNSSC is procuring additional PPS system elements for training and to support maintenance. In contrast to technical support provided to CNSSC stakeholders by CBG for detection equipment maintenance, CNEA will serve more in an advisory, training and expert support role to CNPP and other licensees, as necessary. In this role, CNEA will primarily aim to support CNPP in developing an internal preventive maintenance program for equipment outside of the warranty period to achieve better cost efficiencies and to develop enhanced training on physical protection equipment performance testing and evaluation. CNEA may, upon request by CNPP, provided limited ad hoc support to CNPP on technical support challenges with specific physical protection system equipment and instrumentation.

1.3 MAINTENANCE ORGANIZATION ROLES AND RESPONSIBILITIES

CBG will serve as the lead for the CNSSC technical support programme, based on its significant experience and demonstrated good practices in taking a systematic approach to lifecycle management for radiation detection equipment, in particular for preventive maintenance. CNEA will serve as Deputy Lead for technical support, however, to support physical protection equipment lifecycle management needs among stakeholders.

Technical Support Programme Director

The CNSSC technical support programme director, currently assigned to a CBG Academy senior staff member, holds ultimate accountability for the efficient and effective implementation of this Technical Support Plan. While not typically involved in the day-to-day supervision of maintenance activities, the technical support coordinator is responsible for managing the relationship, communication, and coordination between all local stakeholders, including NSSC maintenance providers, facility managers, and various support organizations, while also overseeing and facilitating the budget process.

Maintenance Coordinators

CNSSC maintenance coordinators are responsible for the day-to-day oversight of all technical support-related activities performed by CNSSC. CBG appoints one maintenance coordinator for detection equipment and CNEA appoints one maintenance coordinator for physical protection equipment. These responsibilities include, but are not limited to, maintenance task selection, maintenance activity

management, maintenance provider selection and contracting, maintenance activity quality assurance, reporting, and documentation. The maintenance coordinators are also responsible for managing the relationships, communications, and coordination among all stakeholders including NSSC maintenance providers, facility managers, and various support organizations.

Vendor Specific Maintenance Manager(s)

Maintenance managers report to and coordinate with the NSSC maintenance supervisor regarding all maintenance activities at the site. Maintenance managers are responsible for the management, conduct, and quality of assigned or contracted maintenance activities in accordance with their maintenance task lists and performance testing requirements.

Spare Parts Coordinator

The spare parts coordinator is responsible for oversight of the spare parts management process. The availability of necessary spare parts enables maintenance providers to perform corrective maintenance tasks in a timely fashion. The ability to perform corrective maintenance tasks in a timely fashion reduces the impact on equipment availability, thereby reducing the impacts on both the success of the mission and efficient test and research operations.

Radioactive Check Source Custodian

Most maintenance, testing, and training activities associated with the NSSC equipment and instrumentation require the availability of radiation sources of specific isotopes and activities. The radioactive check source custodian is responsible for the proper storage, handling, transport, and disposal of such radiation sources in accordance with local, state, and national regulations.

Configuration Management Coordinator

The configuration management coordinator oversees configuration management processes including identifying, documenting, and controlling the technical, physical, and functional characteristics of NSSC-maintained equipment and instrumentation. Additionally, the Configuration Management supervisor manages the change control process to ensure consistency and function and anticipates the overall impact of changes to the entire system. Changes shall be proposed, evaluated, implemented, and tracked using an established systematic approach.

Technical Support Budget Coordinator

The CNSSC budget coordinators, one at CBG and one at CNEA, are responsible for implementing the NSSC maintenance budgeting process to obtain sufficient funding for execution of the maintenance management plan. The NSSC budget coordinators will coordinate closely with the NSSC maintenance coordinators and the technical support programme director to prepare and submit a maintenance budget in accordance with NSSC budget requirements.

Continuous Improvement Coordinator

The continuous improvement coordinator is tasked with implementation and oversight of the NSSC continuous improvement process. CNSSC performs routine assessments and measures Key Performance Indicators (KPIs) to assess and track how well the CNSSC stakeholder equipment and instrumentation is performing and being maintained year-to-year. This information is used to identify and implement specific changes that improve system performance, maintenance processes, or reduce costs.

2. MAINTENANCE SCOPE AND TASK SELECTION

The goals of this section are threefold: identify which pieces of equipment should be actively maintained, develop a list of maintenance tasks to actively maintain the identified equipment, and determine the level

of effort involved in performing those tasks. A proper balance of routine maintenance (RM) and corrective maintenance (CM) is used to provide a high degree of confidence that degradation of facility equipment is prevented, identified, and corrected, that life of the equipment is optimized, and that the maintenance program is cost effective.

2.1 RADIATION DETECTION SYSTEM FUNCTIONAL HIERARCHY

The equipment and instrumentation functional hierarchy is an organizing tool for all maintenance activities. The equipment categories below reflect the current maintenance management activity areas. This functional hierarchy categorizes the maintenance tasks to assist the maintenance manager in developing the maintenance scope required for the site.

Stakeholder	Type of Equipment	Qty
CBG	Radiation Portal Monitors (RPM)	60
	Personal Radiation Detectors (PRD)	250
	Backpack Radiation Detectors (BRD)	10
	High-resolution radioisotope identification devices (RID)	3
	Low-resolution RID	30
	RPM Central Alarm Stations	3
CCG	PRD	100
	Low-resolution RID	10
CNP	PRD	150
	BRD	20
	High-resolution RID	3
	Low-resolution RID	25
	Mobile Detection System (MDS) Van	2
CNEA	Physical Protection Systems, including: • Access control systems • Intrusion detection systems • Video surveillance systems • Central alarm station	Various by type
CNPP	Physical Protection Systems, including: • Access control systems • Intrusion detection systems • Video surveillance systems • Central alarm station	Various by type

Table 1. NSSC Critical Asset List / Functional Hierarchy

Note: Abbreviations for equipment categories are also used in the file names of maintenance procedures for ease of retrieval and organization.

2.2 MAINTENANCE TASK LISTS

Equipment maintenance recommendations are divided into routine maintenance (RM) and corrective maintenance (CM) tasks. RM tasks eliminate, mitigate, or provide warning of an impending asset failure whereas CM tasks restore the functionality of the equipment after a failure has occurred. A proper balance of RM and CM can be used to provide a high degree of confidence that degradation of facility equipment is identified and corrected, that life of the equipment is optimized, and that the maintenance program is cost effective.

CNSSC follows IAEA and vendor guidance on recommended maintenance tasks to facilitate long-term performance of the equipment and instrumentation. These were adapted by CNSSC, adjusted to meet local environmental conditions and regulatory requirements, and are reviewed annually as part of the continuous improvement process.

Separate job aids to be developed as a supplement to this technical support plan:

a. Routine Maintenance Task Planning Worksheet

b. Corrective Maintenance Task List

2.3 MAINTENANCE SCOPE CONFIGURATION BASELINE ITEMS

The following maintenance scope Configuration Baseline items shall be reviewed annually and updated by the maintenance supervisor or designee.

Maintenance Scope Configuration Baseline Items
a. Critical asset list (complete with equipment specs)
b. Equipment / instrumentation functional hierarchy (with abbreviations)
c. Equipment / instrumentation location maps
d. Routine Maintenance Task Planning Worksheet
e. Routine maintenance procedures
f. Corrective maintenance task list
g. Corrective maintenance procedures
h. RPM Maintenance Guide
i. Handheld Instrument Maintenance Guide
j. RPM maintenance software

2.4 MAINTENANCE SCOPE BUDGET ITEMS

All budget request assumptions are to be communicated to the maintenance coordinators no later than June 30th of each year.

Maintenance Scope Budget Line Item(s)	Estimated Annual Cost
Annual Maintenance Task/Procedure List Review	Centralia $500
This line item covers 10 hours of labor for performance of the maintenance task list review and documentation.	

2.5 MAINTENANCE SCOPE CONTINUOUS IMPROVEMENT

Maintenance Scope Line Item	
Annual Maintenance Task List Review:	KPI = 90% of tasks are appropriate (trend increasing)
The Annual Maintenance Task List Review is conducted to review and refine the maintenance task list as reflected in the Maintenance Task Planning Worksheet. In coordination with equipment subsystem maintenance providers, the NSSC maintenance coordinator shall review each routine maintenance task to verify effectiveness to identify or prevent failure, and estimated duration.	

3. MAINTENANCE PROVIDER MANAGEMENT

Effective management of maintenance providers consists of a methodical maintenance provider selection process, maintenance task oversight with a comprehensive maintenance reporting system, and process for tracking provider performance.

3.1 MAINTENANCE PROVIDER SELECTION

Equipment and instrumentation maintenance is performed through a collaboration of maintenance providers with distinct knowledge and skillsets. The general breakdown of maintenance responsibilities is as follows and is reflected on the Maintenance Task Planning Worksheet.

Detection, Communications, and Identification Subsystems

a. DET, COMMS and IDENT subsystem routine and corrective maintenance tasks are performed by the Centralia NSSC Systems Administration Technical Division or approved designee.

Infrastructure Subsystem

a. All INFR subsystem maintenance tasks such as paving, bollards, emergency generators, and HVAC units is performed by the CNSSC under a Memorandum of Understanding (MOU).

3.2 MAINTENANCE ACTIVITY MANAGEMENT

Management of maintenance activities consists of coordinating performance of routine, corrective, and miscellaneous maintenance tasks. Additionally, the maintenance coordinators establish communications protocols and facilitates site access for maintenance provider(s) as required.

3.2.1 Routine Maintenance

Maintenance providers shall perform routine maintenance tasks as defined in their assigned task list using written procedures.

All maintenance providers shall submit an annual projected routine maintenance schedule based on the current maintenance task planning worksheet to the maintenance coordinators by June1st of each calendar year.

The schedule shall identify the dates when routine maintenance tasks are expected to be completed for the upcoming calendar year. The approved schedule shall be considered binding but is subject to change based on agreement of all stakeholders. Routine maintenance tasks not completed within five business days of the schedule date shall be considered “missed,” triggering a maintenance management review.

Unless contacted by the maintenance provider, the maintenance manager shall coordinate system access and scheduled lane closures based on this schedule.

3.2.2 Corrective Maintenance

Maintenance coordinators should respond to system faults and failures in a timely fashion. The maintenance supervisor shall coordinate work with maintenance providers and equipment users to respond to system faults and failures.

1. Equipment users shall report all system faults or failures to the responsible maintenance coordinator immediately during normal working hours or at the daily briefing the next morning if they occur after hours.
2. System faults or failures shall be immediately logged into the CNSSC maintenance log.
3. System faults or failures resulting in equipment downtime for more than eight hours shall be reported to the maintenance manager within one business day.
4. The maintenance coordinate will liaise with the appropriate maintenance provider to identify and correct the fault in a timely manner.

3.3 DOCUMENTATION AND REPORTING REQUIREMENTS

Maintenance providers shall document all maintenance tasks performed using the prescribed report formats. The relevant maintenance coordinator reviews and approves all maintenance reports. Electronic copies of maintenance reports are available in the CNSSC shared filing system.

Documentation and Reporting Requirements include:

a. Routine maintenance reporting

- Frequency: Quarterly
- Deadline: Before the 15th day of the following month

b. Corrective maintenance reporting

- Frequency: As required
- Deadline: Within three working days of completion

c. Maintenance logs

- Frequency: As required
- Deadline: Within two hours of work completion or fault identification

3.4 MAINTENANCE PROVIDER CONFIGURATION BASELINE ITEMS

The following Maintenance Scope Configuration Items shall be reviewed annually and updated by the maintenance coordinators or designee.

Maintenance Provider Configuration Baseline Item(s)
a. Routine maintenance report template
b. Corrective maintenance report template
c. NSSC Maintenance Log

3.5 MAINTENANCE PROVIDER MANAGEMENT BUDGET ITEMS

All budget request assumptions are to be communicated to the maintenance coordinator no later than June 30th of each year.

3.5.1 Routine Maintenance Costs

Routine maintenance costs are based on maintenance provider burdened cost and the routine maintenance task duration and frequency identified in the Maintenance Scope and Task Section.

3.5.2 Corrective Maintenance Costs

Corrective maintenance costs estimates can be derived from reviewing past corrective maintenance expenses as well as leveraging the CNSSC equipment and instrumentation Equipment Cost Estimator tool.

3.5.3 System Upgrade Contingency

The system upgrades are separated into two categories:

1. Significant failure or site damage (for example, RPM vehicle strike)
2. Site or equipment degradation (for example, lane repaving, upgrading computers and servers)

Maintenance Provider Budget Line Item(s)	Estimated Annual Cost
Routine Maintenance Costs	$50,000
Routine maintenance costs are based on maintenance provider burdened cost and the routine maintenance task duration and frequency identified in the Maintenance Scope and Task Section.	
Estimated Corrective Maintenance Costs	$10,000
Corrective maintenance costs estimates can be derived from reviewing past corrective maintenance expenses as well as leveraging the CNSSC equipment / instrumentation Equipment Cost Estimator tool.	
System Upgrade Contingency	$10,000
A contingency budget item is established to address significant failure or site damage. This is estimated using the most probable significant site failure event (RPM truck strike).	
Maintenance Kit	$500
Maintenance tools and test equipment replacement & upkeep.	

3.6 MAINTENANCE PROVIDER CONTINUOUS IMPROVEMENT

Maintenance Provider Continuous Improvement Line Items	
Annual Assurance Visit:	KPI = 3.5 or higher on scale of 5 (trend increasing)
The CNSSC technical support programme director and maintenance coordinators shall conduct an annual assurance visit to evaluate the implementation and effectiveness of maintenance processes for the NSSC equipment and instrumentation. The Assurance Visit Checklist is found on the CNSSC shared filing system.	
Maintenance Provider Assessments:	KPI = 3.5 or higher on scale of 5 (trend increasing)

4. SPARES MANAGEMENT

Effective management of maintenance spare parts is a critical contributor to equipment operating performance and to the cost of the maintenance investment. The CNSSC spare parts management approach ensures that we have the right parts, in the right quantity, in the right place, at the right time, at the least total cost to the organization.

The CNSSC spare parts management process consists of a few basic concepts:

1. Understanding which parts (and how many) are required to maintain critical assets
2. Understanding how to procure the required equipment, anticipating cost, and understanding estimated timelines for replacements/installs
3. Tracking inventory and usage on a regular basis
4. Purchasing (spare) equipment when required
5. Striving to improve the processes

4.1 SPARES INVENTORY AND STOCKING LEVELS

CNSSC spare parts inventory list, stocking levels, and reorder points are in the spare parts management worksheet.

4.2 SPARES PROCUREMENT

Spare parts are procured on an as-needed basis to keep the parts stocking levels in compliance with the recommendations for spare parts. Reorder points indicate the minimum stocking levels allowed for each component. The maintenance coordinators work with the CNSSC procurement contact to order the needed parts.

A spare part sourcing assessment was completed in coordination with the original system maintenance provider. This assessment formed the basis for the information found in the spare parts management worksheet. this assessment shall be reviewed in the fourth quarter of each calendar year by the equipment group maintenance providers and reviewed by the maintenance coordinators. The review shall cover spare part needs, parts availability, procurement source contact information, pricing, lead times, and shipping requirements.

4.3 SPARES INVENTORY MANAGEMENT

Spare parts which support CNSSC stakeholder equipment maintenance in the CBG Academy main building, technical support laboratory. Spares are available 24 hours a day, 7 days (24/7) a week, with a key card required to access the inventory rooms. A spare parts inventory spreadsheet is maintained by the CNSSC spare parts coordinator.

Spare parts will be issued to the maintenance provider on an as-needed basis, and the spare parts inventory sheet will be updated by the CNSSC spare parts coordinator with 2 working days of usage. Spare parts usage statement will be included in all corrective maintenance reports.

The spare parts planning worksheet, physical inventory sheets, and corrective maintenance reports shall be reviewed during the second quarter of each calendar year to inform the spare parts budget request for the following year, which is due to the CNSSC maintenance coordinators by June 30th of each year.

4.4 FAILED PARTS REPAIR AND FAILURE ANALYSIS

Failed parts removed from the system during corrective maintenance activities are to be appropriately tagged by the maintenance provider and turned in to the spare parts coordinator for segregation, storage and appropriate disposition. The approved Failed Part Tag can be found in Appendix F.

The spare parts coordinator will explore part rework opportunities for the failed parts and reconcile fail part counts with spare issue counts as part of the annual spares audit.

4.5 SPARE PARTS CONFIGURATION BASELINE ITEMS

The following spare parts management Configuration Items shall be reviewed annually and updated by the spare parts coordinator or designee.

Spare Parts Configuration Baseline Item(s)
a. Current Spares Planning Worksheet b. NSSC maintenance consumables list c. Failed parts tag template

4.6 SPARE PARTS BUDGET ITEMS

All budget request assumptions are to be communicated to the maintenance supervisor no later than June 30th of each year.

Spares Management Budget Line Item(s)	Estimated Annual Cost
Annual Spare Parts Budget Request	Centralia $2500
Estimate based on the CM reports and spare parts usage from last fiscal year.	
Maintenance Consumables	Centralia $500
Estimated based on the RM and CM reports and consumables usage from last fiscal year.	

Note: It is important to note that multiple small spare part procurements will be made throughout the year to better align annual procurements with actual spare part needs.

4.7 SPARE PARTS CONTINUOUS IMPROVEMENT

Spare Parts Continuous Improvement Line Item	
Spares Inventory:	KPI = 80% accuracy (trend increasing)
The spare parts coordinator shall coordinate with maintenance providers to perform a physical inventory of all spare parts during the second quarter of each calendar year. The numbers of each part available should lie between the reorder point and the optimal stocking level.	
Parts Availability Review	KPI = 100% completed on time (trend increasing)
The availability of spare parts (procurement source identified), associated price, and lead times shall be reviewed and updated once a year by the NSSC spare parts coordinator and equipment group maintenance providers by September 1st of each calendar year.	

5. RADIOACTIVE CHECK SOURCE MANAGEMENT

Most research, testing, and maintenance activities associated with the CNSSC stakeholder equipment and instrumentation require the use of radiation sources of specific isotopes and activities. The storage, handling, transport, and disposal of such radiation sources are subject to laboratory and national regulations. Radioactive check sources are mandatory to complete the following activities:

a. Radiation detector testing activities (RPMs and handhelds)

b. Maintenance and repair activities for the RPM and handheld detection equipment

c. Training activities for operators, maintenance providers, and stakeholders.

CNSSC is the source owner, licensee, and custodian of all radioactive check sources used to support research, testing, and maintenance activities efforts at CNSSC. Radioactive check sources are available for check out to authorized users 24/7 from the appropriate storage locations.

Gamma and neutron check source strengths have a significant impact on the results obtained during RPM calibration, testing, and maintenance, thus it is critical to maintain an inventory of sources that have activities that are within an acceptable range. The following table lists specific requirements for acceptable radioactive check sources to meet current CNSSC technical support requirements. NSSC will maintain a current set of all three sources to preserve the capability to support NSSC mission requirements.

Isotope	Initial Activity	Useful Activity Levels	Half Life (yrs)	Useful Life (yrs)
^{137}Cs	370kBq (10μCi)	370 – 75kBq (10 – 2.0μCi)	30.08	70
^{241}Am	185 kBq (5 μCi)	185 – 74 kBq (5 – 2 μCi)	432.6	Indefinite
^{241}AmBe	175 MBq (4.73 mCi)	6500- 11000 n/sec	432.6	Indefinite

5.1 RADIOACTIVE SOURCE PROCUREMENT

The radioactive check source procurement process takes approximately nine months from application of licenses to source receipt. In summary, the process includes the following steps:

a. Request the radioactive check source custodian perform a review of the appropriate Facility Use Agreement (FUA) to ensure the storage and use of those specific sealed sources is allowed.
b. The radioactive check source custodian notifies the facility radioactive material inventory custodian of intent to purchase or use sealed source, and ensures source is pre-screened by appropriate procedures.
c. Complete a marketplace purchase request, complete appropriate approval forms, and send them to the technical support programme director.
d. The radioactive check source custodian must review and approve purchase requests for new source requests.
e. Contact the area radiological controls technician for consultation on CNRA regulatory requirements for safety and security.
f. Upon receipt notification of radioactive sources, source registration, labelling, survey, and leak testing must be completed.

5.2 RADIOACTIVE CHECK SOURCE STORAGE, USE, AND ACCOUNTABILITY

At CNSSC, radioactive check sources are used in accordance with CNRA requirements. Access to sources is controlled by means of administrative and engineering measures appropriate for the category of source. Measures in place for control of access to sources include controlled access, physical barriers, and locks.

5.2.1 Radioactive Check Source Labelling Requirements

Each source, storage container, or device containing a source bears a durable, clearly visible label bearing the standard radiation warning and markings as defined by CNRA regulatory requirements. Labels must provide sufficient information to permit individuals handling, using, or working in vicinity of source, storage container, or device containing source, to take precautions to avoid or control exposure.

Labels must remain visible, legible, and attached to each sealed source, container, device, or storage location.

5.2.2 Radioactive Check Source Storage Requirements

Radioactive check sources at CNSSC shall be stored in the manner prescribed by CNRA regulatory requirements. CNSSC radioactive check sources are stored in a locked cabinet at CBG Academy, technical support laboratory. Both storage locations are access controlled with multi-layer key card access.

5.2.3 Radioactive Check Source Accountability and Access Controls

Radioactive check sources are available for check out to authorized users 24/7 using their site key card access. Radioactive check sources shall be signed in and out using the Radioactive Check Source Accountability Log on every use. The authorized source user list is in the front of the source accountability log and shall be verified before source check out. Source users shall comply with all CNRA regulatory requirements for accountability and access.

5.2.4 Radioactive Check Source Inspection and Inventory Requirements

Radioactive check sources shall be physically inventoried quarterly, and the radioactive check source inventory sheet shall be reviewed and archived for a period of five years. Radioactive check sources shall be leak checked. The NSSC RSC is responsible for arranging the inspections and testing and maintaining documentation of the results.

5.3 RADIOACTIVE CHECK SOURCE CONFIGURATION BASELINE ITEMS

The following Radioactive Check Source Configuration Items shall be reviewed annually and updated by the NSSC radioactive check source custodian or designee.

Spare Parts Configuration Baseline Item(s)
a. All radioactive check source certificates b. Current end-user statement for each source c. Annual Radioactive Check Source Leak Test Reports d. Radioactive check source accountability log template

e. Completed radioactive check source accountability logs (maintain five years)

f. Annual Radioactive Check Source Inventory Report template

g. Completed Annual Radioactive Check Source Inventory Reports (maintain 5 years)

5.4 RADIOACTIVE CHECK SOURCE MANAGEMENT BUDGET ITEMS

All budget request assumptions are to be communicated to maintenance coordinator no later than June 30th of each year. These expenses will not occur every year, as they are driven by check source expiration dates.

Radioactive Check Source Management Budget Line Item(s)	Estimated Cost
Source Procurement	
^{137}Cs C$250 ^{241}Am C$2000 ^{241}AmBe C$12000	C$14250
Technical Support	
Technical support for source leak checks and inter facility movements.	C$10000

5.5 RADIOACTIVE CHECK SOURCE MANAGEMENT CONTINUOUS IMPROVEMENT

Radioactive Check Source Management Continuous Improvement Line Item (s)	
Annual Source Accountability Review:	KPI = 100% source accountability (zero tolerance)
The radioactive check source custodian shall perform a radioactive check source accountability and security assessment. All licensed radioactive sources shall be physical accounted for and stored in accordance with local requirements. Review results shall be documented and stored on the NSSC Maintenance SharePoint.	

6. CONFIGURATION MANAGEMENT

The configuration management coordinator employs disciplined configuration management processes to document, review, and control the physical, functional, and operational characteristics of the installed RDS.

The benefits of a strong configuration management system include:

- Historical knowledge of system function and development (configuration baseline)
- Change control process
- Periodic configuration item verification and accountability

Over time, the configuration management coordinator anticipates making technological improvements and changes to systems and components. To meet system requirements, ensure consistency and function, and anticipate the overall impact to the entire system, these changes shall be proposed, evaluated, and implemented in accordance with approved processes and procedures.

6.1 CONFIGURATION BASELINE

CNSSC stakeholder systems were baselined upon official acceptance of the installation. To re-baseline the system, CBG, working with CNSSC stakeholders, identified items which shall be controlled to establish accountability and informational integrity of all facets of the installation. This means that all of the configuration items and their settings are final and official as of that date.

The Configuration Item List includes hardware specifications, software and firmware versions, parameter settings, IP [internet protocol] addresses and passwords, maintenance and operating procedures, and training materials that are critical to the proper functioning of the systems or are costly and require special management. The Configuration Item List is categorized and organized to align with the core maintenance capabilities as described in this document. The configuration management coordinator shall work with the other core capability contacts to maintain the system configuration in accordance with the processes and procedures outlined in this section.

CNSSC maintains a comprehensive, access controlled, digital database of configuration-controlled items which can be found on the CNSSC internal file sharing system.

6.2 CONFIGURATION ITEM CHANGE CONTROL

The objective of change control is to maintain consistency among design requirements, the physical configuration, and the related facility documentation, even as changes are made. The change control process is used to ensure changes are properly reviewed and coordinated across the various organizations and personnel responsible for activities and programs at the facility. It is important that all relevant stakeholders and authorities are identified and take part in this process. The maintenance point of contact for the configuration management coordinator is responsible for managing all configuration changes and maintaining the installed baselined configurations.

6.2.1 Change Request

Anyone requesting a change to a configuration item must complete and submit a written change request to the maintenance point of contact for configuration management supervisor.

6.2.2 Change Review Process

The maintenance point of contact for configuration management coordinator shall convene change control meetings with all relevant stakeholders and authorities, as needed, to review requests. Relevant stakeholders will review the proposed change to verify that:

a. Technical review was adequately performed

b. Change control package is complete and ready for implementation

c. Any necessary external reviews and approvals have been obtained

d. Funding is expected to be available to complete implementation and update the documentation

e. Change is necessary

f. Benefits of the change warrant the cost and schedule impacts

g. Funding source to complete the change

h. Criteria for management approval

6.2.3 Configuration Change Impact Chart

RPM Parameters
RPM firmware specifications
Maintenance and repair training materials
Maintenance procedures
Change or update CAS software
Software specifications
Maintenance and repair training materials
Maintenance procedures
Operating procedures
Radiation Detection Equipment
Concept of operations (CONOPS)
Standard operating procedures (SOPs)
Maintenance and repair training materials
Maintenance procedures document
Conduct Technical Refresh
Hardware specifications document
Software specifications document
Maintenance and repair training materials
Maintenance procedures document
CAS Equipment
Hardware specifications document
Maintenance and repair training materials
Maintenance procedures document
Change or Update Staffing
CONOPS
SOPs

6.2.4 Change Implementation

Once proposed changes are reviewed and approved, they must be implemented consistently with the approved change control package. Work must be performed consistently with hazard controls using approved instructions, procedures, or other appropriate means. The individual requesting the change has the responsibility for tracking the change status and ensuring that the change is completed in accordance with the change control package.

Once the change is complete, the requestor and configuration management coordinator shall validate that the system or component performs as intended and operates within the design requirements after the change is installed and before turnover to operations. These tests serve as the final and independent check of the adequacy of the design review for the proposed change. All affected documents identified as part of the design review of changes shall be updated in a timely manner.

6.3 CONFIGURATION AUDITS

To maintain and verify configuration accountability, the configuration management coordinator shall conduct regular configuration self-assessments. These are in-depth reviews of the configuration of the RDS, its components, settings, and documentation to verify RDS physical and functional characteristics. These assessments shall be performed as part of the continuous improvement process according to documented procedures to determine whether a configuration item conforms to its requirements and the approved baseline configuration information. A configuration audits shall be scheduled, coordinated, and

completed by the configuration management coordinator and the applicable core maintenance capability contact.

6.3.1 Configuration Status Report

The configuration management coordinator shall document the self-assessment information in a Configuration Status Report. The report will include the condition (location, manufacturer, model number, serial number, IP address, version, date) of each configuration item (documents and procedures as well as equipment) upon installation and after change approval.

The Configuration Status Report shall be generated annually and consists of a list of all configuration items (with current version) and a list of all change requests with their implementation status.

6.4 CONFIGURATION ITEM SUMMARY

The following Configuration Management Configuration items shall be reviewed annually and be kept updated by the configuration management coordinator or designee.

Configuration Item Summary
Maintenance Scope Configuration Item(s)
Critical Asset List (complete with equipment specs) Functional Hierarchy Radiation Detection System Equipment Location Map Routine Maintenance Task List Routine Maintenance Procedures Corrective Maintenance Task List Corrective Maintenance Procedures RPM Maintenance Guide Handheld Instrument Maintenance Guide RPM Maintenance Software
Maintenance Provider Management Configuration Item(s)
Maintenance Contract SOW Template Maintenance Contract Memorandum of Understanding (MOU) Template Routine Report Template Corrective Maintenance Report Template Maintenance Provider Performance Assessment Tool
Spare Parts Management Configuration Item(s)
Spare Parts Planning Worksheet Maintenance Consumables List Failed Parts Tag Template
Radioactive Check Source Management Configuration Item(s)
Importation of Radioactive Sources (IAEA Category 5), form Radioactive Source Storage and Use (IAEA Category 5), form All Radioactive Check Source Certificates Current End-User Statement for each source Annual Radioactive Check Source Leak Test Reports Radioactive Check Source Accountability Log Template Completed Radioactive Check Source Accountability Logs (maintain five years) Annual Radioactive Check Source Inventory Report Template Completed Annual Radioactive Check Source Inventory Reports (maintain five years)

Radioactive Check source Disposal Request Form
Configuration Management Configuration Item(s)
Configuration Item List Configuration Change Form Configuration Item Verification Report Template
Maintenance Budget Configuration Item(s)
Maintenance budget request forms (previous five years)
Continuous Improvement Configuration Item(s)
Self-Assessment List KPI List and Definitions Continuous Improvement Progress Tracking Plan

6.5 CONFIGURATION MANAGEMENT BUDGET ITEMS

All budget request assumptions are to be communicated to the maintenance coordinator no later than June 30th of each year.

Configuration Management Budget Line Item(s)	Estimated Annual Cost
Configuration Item Audit	$250
Line item from contracts for reviewing associated configuration items.	

6.6 CONFIGURATION MANAGEMENT CONTINUOUS IMPROVEMENT

Configuration Management Continuous Improvement Line Item (s)	
Annual Configuration Item Audit	KPI = 80% accuracy (trend increasing)
Configuration item audits shall be performed by the maintenance supervisor or designee to determine whether each configuration item conforms to its requirements and the approved baseline configuration information. Configuration audits verify the physical and functional characteristics of installed configuration items (e.g., hardware, software, settings).	
Configuration Item Discrepancy Tracking	KPI = 80% discrepancies corrected within three months (trend increasing)
Track the status of the effort to correct known configuration item discrepancies. All identified configuration item discrepancies must be corrected with three months of the date of discovery.	

7. MAINTENANCE BUDGET

The maintenance coordinator in coordination with the technical support budget coordinator is responsible for preparing and submitting a maintenance budget. All budget request assumptions are to be communicated to the maintenance supervisor no later than June 30th of each year. The annual maintenance budget request shall be approved by the technical support programme director before final submittal.

The CNSSC budget is on a calendar year cycle, and the initial budget submittal is due to Ministry of Finance no later than September 30th for the upcoming budget year. Subsequent reviews and budget finalization steps are shown below.

Task	Date	Responsibility
Draft budget request submittal	Sept. 30 th	NSSC maintenance supervisor
NSSC Finance budget draft	Oct. 31st	NSSC Finance Department
Budget review and comment	Nov. 15 th	NSSC maintenance manager
Final budget	Dec. 15th	NSSC Finance Department

7.1 BUDGET SUMMARY

The budget summary is reflected below. (Rolled up from other sections). All amounts in Centralia dollars.

Maintenance Scope Budget Line Item(s)	**Estimated Annual Cost**
Annual Maintenance Task/Procedure List Review	**$250**
Labor: This line item covers 10 hours of labor for technicians to performance of the maintenance task list review and documentation.	
Maintenance Provider Management Budget Line Item(s)	**Estimated Annual Cost**
Maintenance Contract	**$20,000**
The technician maintenance contract has a 2-year period of performance. The contract is renegotiated mid-point during the second year to avoid gaps in maintenance coverage.	
Maintenance Kit (Tools and test equipment replacement & upkeep)	**$500**
Contingency budget set aside for the upkeep and replacement of required tools and test equipment.	
Spares Management Budget Line Item(s)	**Estimated Annual Cost**
Annual Spare Parts Budget Request	**$2000**
Estimated based on the CM reports and spare parts usage from last fiscal year.	
Maintenance Consumables	**$250**
Estimated based on the RM and CM reports and consumables usage from last fiscal year.	
Radioactive Check Source Management Budget Line Item(s)	**Estimated Cost (Not Annual)**
Source Procurement	**$14250**
^{137}Cs ^{241}Am ^{241}AmBe	$250 $2000 $12000
Import Licensing, VAT, Transportation	**$1100**
Licensing VAT (10%) Shipping Transportation from airport	$250 $250 $500 $100
Disposal, Transportation	**$800**
Disposal Fee (to source vendor) Shipping Transportation to airport	$200 $500 $100
Configuration Management Budget Line Item(s)	**Estimated Annual Cost**
Configuration Item Audit	**$250**
Line item from Oldstone contract for reviewing associated Configuration Items.	
Continuous Improvement Budget Line Item(s)	**Estimated Annual Cost**

Configuration Item Audit	N/A
None	

7.2 MAINTENANCE BUDGET CONFIGURATION ITEMS

The following Maintenance Budget Configuration Items shall be reviewed annually and be kept updated by the CNSSC technical support budget coordinator or designee.

Maintenance Budget Configuration Item(s)
NSSC Maintenance budget request forms (previous five years)

7.3 MAINTENANCE BUDGET CONTINUOUS IMPROVEMENT

Maintenance Budget Continuous Improvement Line Item (s)	
Budget Compliance	**KPI = $0 shortfall, <10% carryover**
The goal for CNSSC maintenance budget process is to secure the appropriate amount of funding for implementation of the technical support plan without having significant unused carryover at the end of the fiscal year. Contingency budgets for emergency repairs, tools, and test equipment are exempt from this standard.	

8. CONTINUOUS IMPROVEMENT

CNSSC performs routine self- assessments and measurement of KPIs to monitor the health of the maintenance organization as well as the health and functionality of the installed system. This information is used to identify and implement specific changes that improve system performance and technical support processes or reduce costs. Trending metrics over time indicate the success that has been achieved as well as highlight potential problem areas and irregularities in order to drive the desired behaviours or areas for improvement.

The coordinators of the various core maintenance capabilities are responsible for performing self-assessments and tracking KPIs within their own discipline. The continuous improvement coordinator provides oversight and assistance, tracks progress of change implementation, and rolls up all continuous improvement activities into a single annual report for submission to the CNSSC maintenance coordinator.

8.1 SITE SELF-ASSESSMENT SUMMARY

(Rolled up from other sections)

Maintenance Scope Continuous Improvement Line Item(s)	
Annual Maintenance Task List Review	**KPI = 90% of tasks are appropriate (trend increasing)**
The Annual Maintenance Task List Review is conducted to review and refine the maintenance task list as reflected in the Maintenance Task Planning Worksheet. In coordination with equipment subsystem maintenance providers, the CNSSC maintenance coordinator shall review each routine maintenance task to verify effectiveness to identify or prevent failure, and estimated duration.	
Maintenance Provider Management Continuous Improvement Line Item(s)	
Annual Assurance Visit	**KPI = 3.5 or higher on scale of 5 (trend increasing)**

The CNSSC maintenance coordinator shall conduct an annual assurance visit to evaluate the implementation and effectiveness of maintenance processes for the radiation detection systems.	
Maintenance Provider Assessments:	**KPI = 3.5 or higher on scale of 5 (trend increasing)**
The CNSSC maintenance coordinator will measure and track the maintenance provider's performance in terms of technical proficiency, responsiveness, and proper reporting deliverables on an annual basis.	
Spares Management Continuous Improvement Line Item(s)	
Spares Inventory	**KPI = KPI = 80% accuracy (trend increasing)**
The spare parts coordinator shall coordinate with maintenance providers to perform a physical inventory of all spare parts during the third quarter of each calendar year. The numbers of each part available should lie between the reorder point and the optimal stocking level.	
Local Parts Availability Review	**KPI = 100% completed on time (trend increasing)**
The availability of spare parts (procurement source identified), associated price, and lead times shall be reviewed updated once a year by the CNSSC spare parts coordinator and equipment group maintenance providers by September 1st of each calendar year.	
Radioactive Check Source Management Continuous Improvement Line Item(s)	
Annual Source Accountability Review	**KPI = 100% source accountability (zero tolerance)**
The radioactive check source custodian shall perform a radioactive check source accountability and security assessment. All licensed radioactive sources shall be physically accounted for and stored in accordance with local requirements.	
Configuration Management Continuous Improvement Line Item(s)	
Annual Configuration Item Audit	**KPI = 80% accuracy (trend increasing)**
Configuration Item audits shall be performed by the CNSSC maintenance coordinator or designee to determine whether each Configuration Item conforms to its requirements and the approved baseline Knowledge information. Knowledge audits verify the physical and functional characteristics of installed Configuration Items (e.g., hardware, software, settings).	
Configuration Item Discrepancy Tracking	**KPI = 80% discrepancies corrected within three months (trend increasing)**
Track the status of the effort to correct known Configuration Item discrepancies. All identified Configuration Item discrepancies must be corrected with three months of the date of discovery.	
Maintenance Budget Continuous Improvement Line Item(s)	
Budget Compliance	**KPI = $0 shortfall, <10% carryover**
The goal for CNSSC maintenance budget process is to secure the appropriate amount of funding for implementation of the technical support plan. Contingency budgets for emergency repairs, tools, and test equipment are exempt from this standard.	
Continuous Improvement Program Continuous Improvement Line Item(s)	
Self-Assessment Findings	**KPI = 80% discrepancies corrected within three months (trend increasing)**
Adverse findings from self-assessment efforts shall be documented and tracked through completion. The goal is to resolve all findings within three months of the finding date.	

8.2 SELF-ASSESSMENT PROGRAM FINDINGS MANAGEMENT

The Issues Management process involves:

a. Identifying and analysing issues discovered in the self-assessment process

b. Mitigating issues through corrective actions

c. Documenting and tracking issues through resolution

d. Evaluating the effectiveness of implemented corrective actions

e. Communicating lessons learned and best practices

8.3 CONTINUOUS IMPROVEMENT PROGRAM CONFIGURATION ITEMS

The following Continuous Improvement Program Configuration Items shall be reviewed annually and kept updated by the continuous improvement coordinator or designee.

Continuous Improvement Configuration Item(s)
Self-Assessment List KPI List and Definitions Continuous Improvement Progress Tracking Sheet

8.4 CONTINUOUS IMPROVEMENT PROGRAM BUDGET ITEMS

All budget request assumptions are to be communicated to the maintenance supervisor no later than June 30th of each year.

Continuous Improvement Program Budget Line Item(s)
None

8.5 CONTINUOUS IMPROVEMENT PROGRAM CONTINUOUS IMPROVEMENT

Continuous Improvement Program Continuous Improvement Line Item (s)	
Self-Assessment Findings	**KPI = 80% discrepancies corrected within 3 months (trend increasing)**
Adverse findings from self-assessment efforts shall be documented and tracked through completion. The goal is to resolve all findings within three months of the finding date.	