SAND2010-1217C

Enabling Objectives

- Explain the definition and purpose of a *Potentially Inadequate Safety Analysis* (PISA).
- Identify the three steps to the PISA process, and potential entry conditions.

What is meant by the term "PISA?"

- A PISA is a condition in which
  - the safety basis may be inadequate;
  - the physical condition may not be accurate because the safety analysis may not match the current physical configuration of the facility; or
  - the safety analysis may be inappropriate or contain errors.

What is Meant by the Term PISA?

- You don't have to prove a problem to enter into the PISA process.
  - The PISA process must be entered when a contractor identifies or is informed of a situation that indicates the safety analysis supporting the DOE-approved safety basis may not be bounding or may be otherwise inadequate.

Purpose of PISA Process

- The purpose of the PISA process is to evaluate situations where it is discovered that the existing configuration of the facility may be different from that described in the safety basis.
- If the situation, in any way that *calls into question information contained in the DSA, TSRs, or supporting calculations that* ***materially affect the conclusions reached by or the adequacy of*** *the DSA, TSRs, or supporting analyses,* the PISA process is invoked.

Purpose of PISA Process

- The PISA process **does not** apply to
  - the process of upgrading DSAs in response to new requirements; or
  - the use of new or different analytical tools during the upgrade process.

Potential Entry Conditions into PISA Process

- Operational events, new information, and discrepant, as-found conditions do not require automatic entry into the PISA process ***unless they call into question and materially affect the information and conclusions contained in the safety analysis*** (e.g. DSA, TSRs, or supporting calculations).
- Does the event have the potential to cause one of the seven questions in the USQD worksheet to be answered “Yes”? If so, invoke the process.

"As-Found Condition"

- An "as-found condition" is one where the actual physical configuration of the facility or experimental setup does not agree with that described in the safety analysis.

Potential Entry Conditions Into PISA Process

- **Discrepant As-Found Conditions**
  - Differences between the existing safety basis and the current physical configuration of the facility that have the potential for calling into question information relied upon in the safety analysis (a situation where the actual physical configuration in the facility does not match the DSA.)
    - This may result from an error in the DSA or an error in the facility configuration.
    - A discrepant as-found condition is a PISA when the discrepant as-found condition reveals an error in the safety analysis or facility configuration.
    - Does not apply to normal expected SSC degradation or breakdown provided the SSC is restored to nonconformance with documented design descriptions and specifications.

As-Found Condition

- The following questions provide guidance to determine if an as-found condition is discrepant and should enter the PISA process:
  - Are aspects of the physical configuration or operation important to the conclusions reached by the safety analysis incorrect?
    - The DSA states that all fire doors are red (as-found)
    - A shielding wall does not provide the level of protection assumed in the analysis (discrepant as-found)
    - Structure will not withstand the design basis earthquake for which it was designed (discrepant as-found)
    - DSA states door is 2 inches thick but door is actually 2.25 inches thick (as-found)
    - Fire suppression system will not provide the level of coverage it was designed for and credited for in the analysis (discrepant as-found)

As-Found Condition

- Has a physical modification or operational change been discovered that is not reflected in the safety analyses?
  - Penetration has been cut into fire wall credited in analysis (discrepant as-found)
  - Required operator surveillance removed from procedure (discrepant as-found)
  - Safety valve replaced with a valve of a different type that does not function as quickly (discrepant as-found)
  - Eye wash replaced by an eyewash made by a different manufacturer (as-found)

As-Found Condition

- Has an existing facility condition been discovered that may be outside of the bounds of the existing analyses?
  - More or different types of material present than was assumed in the analysis (discrepant as-found)
  - Explosives present when the analysis assumed that they were not (discrepant as-found)

New Information (NI) Process

- **New Information**
  - New information or errors in the existing safety basis that have the potential to call into question information relied upon in the safety analysis but is not sufficiently mature to be actionable.
    - Analytical errors might involve use of incorrect input values, invalid assumptions, use of an improper model, or calculation errors.
    - A change in the analysis that would result from application of new DOE requirements (e.g., change in required analytical methods or threshold values) would not constitute an analytical error or inadequate safety analysis.

New Information (NI) Process

- **New Information**
  - If not mature enough to be actionable within 10 calendar days, the manager for the facility evaluating the NI shall notify the Safety Basis Department of the status of the situation and shall work with the Safety Basis Department to bring the NI to maturity.

New Information Process

- The NI Process is used to track and disposition NI issues. Information to be considered includes, but is not limited to:
  - whether information is draft or final;
  - potential consequences;
  - frequency of potential accidents; and
  - source of information.

NI Processing

Upon receipt of NI, the Safety Basis Department and operational support staff for a given Sandia hazard category 1, 2, or 3 DOE nuclear facility qualified in the USQ process perform the following actions:

1. Determine if the NI is applicable to a facility, process, or SSC described in the safety basis.
2. Initiate completion of the form SF 2001-NIP.

NI Processing

3. Determine if the NI is mature enough to be confirmed as a valid issue.
   a. If the NI is NOT mature enough at the time to confirm a valid issue, then continue the NI investigation until it has reached maturity.
   b. If the NI is mature enough at the time to confirm a valid issue, then:
      - Indicate a “Yes” answer to the maturity question on SF 2001-NIP, and
      - Continue to step 4 in this process.

NI Processing

4. Determine if the NI is significant enough to warrant implementing compensatory measures to assure current operations are safe prior to any assessment of the NI.

New Information Processing Form (SF2001-NIP) – Identification of NI

- **What makes a good NI description?**
  - Concise
    - Focuses on the safety significance of the NI relative to the facility safety basis;
    - Provides enough information so that someone unfamiliar with the facility can appreciate the safety significance of the NI; and
    - Establishes the facts to be evaluated, their source and their credibility.

New Information Process

- The NI Process is designed to evaluate and track new information to the point of resolution. NI can be sorted into two different categories of resolution:
  - The NI is ***within the scope*** of the current safety basis and the associated entry in the NI Process can be closed; or
  - The NI ***may not be within the scope*** of the current safety basis and should be considered for entry conditions to the PISA process.

Potential Entry Conditions Into PISA Process

- Operational Events
  - occurrences that bring into question the validity of models used to predict system or personnel response; or
  - consequences that exceed what was analyzed and presented in the DSA.

Operational Events

- An operational event that identifies information that has the potential to exceed the boundaries of the safety basis documentation must be evaluated through the USQ process.

Operational Events

- The following questions provide guidance to determine if information relating to an operational event should enter the PISA process:
  - Did an operation event progress differently than anticipated and could it have potentially exceeded the bounds of the safety analyses?
  - Is the event or incident significant, or does it have the potential to affect safety functions in the facility?
- If it is determined that the operational event should enter the PISA process, then proceed accordingly. Otherwise, document the evaluation of the operational event using the USQ process.

PISA Process

- Once it is determined that an entry condition has been met, the facility must initiate PISA required actions, and a PISA shall be declared according to established occurrence reporting criteria.

Potential Inadequate Safety Analysis

- Upon verification of a PISA, the contractor shall take required actions per 10 CFR 830.203(g):
  - Take appropriate action to place or maintain the facility in a safe condition;
  - Expeditiously notify DOE of the situation; and
  - Perform a USQ Determination promptly and notify DOE of the results.

From DOE G 424.1-1A, "Implementation Guide for Use in Addressing Unreviewed Safety Question Requirements"

Potential Inadequate Safety Analysis

- Upon verification of a PISA, the contractor shall take required actions per 10 CFR 830.203(g):
  - Complete an evaluation of the safety of the situation (ESS) and submit it to DOE prior to removing any operational restrictions implemented to compensate for the analytical discrepancy. The ESS must address the results of the USQD, any evaluation of safety performed, and any necessary JCO or interim measures being taken.

From DOE G 424.1-1A, "Implementation Guide for Use in Addressing Unreviewed Safety Question Requirements"

Evaluation of the Safety of the Situation (ESS)

- An ESS is a safety analysis that demonstrates adequate safety with the existing situation so that any interim measures (operational restrictions) to maintain the facility in a safe condition can be removed. If adequate safety cannot be demonstrated, then the analysis should be accompanied by, or followed with, a proposed resolution, with a safety analysis that does demonstrate adequate safety.
- As part of the PISA process, an ESS is a determination of the actual safety of a proposed activity or discovered condition.

Evaluation of the Safety of the Situation

- An ESS is the Facility Manager's qualitative assessment of the relative risk of the situation and provides justification to DOE for removal of controls.

- For a positive PISA USQD, the qualitative assessment of the evaluation of safety of the situation could be the basis of a justification for continued operations (JCO).

Time to Identify Potential Inadequacies

- Facility management is allowed a reasonable time prior to notifying DOE to confirm the reasonableness of the *potential* for having an inadequate safety analysis, but this time should be on the order of hours, up to several days, and not a matter of weeks or months.

From DOE G 424.1-1A, "Implementation Guide for Use in Addressing Unreviewed Safety Question Requirements"

PISA Required Actions

- Place facility in a safe condition
  - Includes operability determination;
- Notify the NNSA/SSO; and
- Perform a backward-looking PISA USQD for each situation.

Backward Looking USQD

- Evaluate the change by looking back in time to a point before the discrepancy was discovered, and perform a USQD evaluation as if it were a proposed change.

Operability Determination

- An operability determination is a forward-looking evaluation by the operating contractor of whether there is a reasonable expectation that continued operation of the facility is safe even when a degraded or nonconforming condition (PISA) and USQ exists.

From DOE G 424.1-1A, "Implementation Guide for Use in Addressing Unreviewed Safety Question Requirements"

Operability Determination

- An immediate operability determination should be made, based on the best available information and operational restrictions imposed, if necessary, upon confirmation of the condition.
- Restoration actions for the degraded or nonconforming condition must be developed by the contractor and scheduled at the first available opportunity based on safety significance and extent of restoration actions.
- A final determination should be made and documented following a thorough engineering evaluation. The final operability determination may be included as part of the ESS required to be submitted to DOE before removal of any operational restrictions.

From DOE G 424.1-1A, "Implementation Guide for Use in Addressing Unreviewed Safety Question Requirements"

PISA Process

- If the USQD is negative:
  - Prepare and submit the USQD and an ESS to NNSA/SSO
    - The content of the evaluation of the safety of the situation should include a description of the situation and appropriate background information; the current status of the facility; an evaluation of the situation with a hazard or safety analysis (as appropriate); a summary of compensatory measures that were put in place; and a summary of conclusions.
  - Close the occurrence report with an update showing the negative USQD results, the ESS, and NNSA/SSO's concurrence with the ESS and approval to lift any compensatory measures that were implemented as a result of the PISA.

PISA Process

- If the USQD is positive, and an actual inadequacy of the safety analysis exists:
  - Prepare and submit the USQD and an ESS to NNSA/SSO for approval.
    - The evaluation of safety shall include a safety analysis, a management plan for addressing deficiencies, a proposed DSA change or Justification for Continued Operation (JCO).

PISA Process

- Notify NNSA/SSO by updating the Occurrence Report.

- Obtain NNSA/SSO approval prior to taking further actions, including the removal of operational restrictions.

PISA Process

- Close out the Occurrence Report upon receipt of final NNSA/SSO approvals.

- Written correspondence from Sandia to DOE/NNSA relating to PISAs are concurred with by the Safety Basis Department.

Section Summary

- Explain the definition and purpose of the PISA Process ☑
- Identify the three steps to the PISA Process, and potential entry conditions. ☑