MFFFPEm Resource

From: Tiktinsky, David
Sent: Wednesday, February 03, 2010 9:21 AM
To: Tripp, Christopher; Hrabal, Craig
Cc: Oesterle, Eric; Morrissey, Kevin; Roman, Cinthya; MFFFHearingFile Resource
Subject: FW: LA Chapter 6
Attachments: tech.gif; LA Chap 6 Changes.pdf

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From: Gwyn, Dealis W. [mailto:DWGwyn@moxproject.com]
Sent: Wednesday, February 03, 2010 7:32 AM
To: Tiktinsky, David
Subject: LA Chapter 6

Dave

Attached is the changes for LA Chapter 6. Based on our understanding, these were the only changes needed for the LA and ISAS due to the follow-on criticality questions.

Let me know if you have questions.

Dealis

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From: Tiktinsky, David

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Recipients:
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at least once every two years, to ascertain that procedures are being followed and that process conditions have not been altered to adversely affect NCS requirements and/or controls. The frequency for procedure reviews, if less than annually, will be based on the risk-informed methodology determination which will consider the safety significance of the activity, results of the Integrated Safety Analysis (ISA), and/or performance history. The reviews are conducted, in consultation with operating personnel, by MFFF staff that is knowledgeable in the nuclear criticality safety.

6.2.5 Change Management

The NCS functional organization shall review proposed changes to structures, systems and components (SSCs), hardware, software, processes and procedures to ensure that proposed facility changes are managed to maintain the integrity of the facility's safety basis and to ensure that proposed changes receive the appropriate level of NCS review. The NCS review assures that the ability of the NCS credited SSCs and/or IROFS to perform their function when needed is maintained. The NCS functional organization reviews and approves proposed changes in process conditions or equipment involving fissionable material as part of the MFFF configuration management and design change process to determine whether the facility changes require prior NRC approval in accordance with the criteria of 10 CFR §70.72, *Facility Change Process*.

6.3 NUCLEAR INCIDENT MONITORING SYSTEM

The purpose of the nuclear incident monitoring (NIM) system is to reduce risk to personnel by providing prompt warning and notification should a nuclear criticality event occur. The design and operation of the NIM system also takes into consideration the avoidance of false alarms. Alarm actuation setpoint(s) are specified with consideration of normal operating background radiation levels such that spurious actuations from sources other than criticality do not occur. The NIM system is designed in accordance with 10 CFR 70 and ANSI/ANS-8.3-1997 (R2003).

In the highly unlikely event of a nuclear criticality, the NIM system is intended to:

- Monitor for excessive radiation
- Monitor appropriate areas
- Warn personnel as quickly as possible.

The NIM system, which utilizes both fixed and portable (for maintenance only) monitoring units, is designed in accordance with generally accepted practices in R.G. 3.71, Rev 1 October 2005 and those required by 10 CFR §70.24. ANSI/ANS-8.3-1997 (R2003), *Criticality Accident Alarm System*, is the guidance document that defines the design criteria and functional operation requirements of the NIM system (or criticality accident alarm system). These features assure detection capability and prompt notification by clear audible alarm, visual light, or other notification means to warn personnel of a criticality condition. Criticality monitoring is performed by groups of detectors called "monitoring units." Each NIM system monitoring unit contains multiple gamma detectors that provide a redundant detector actuation logic thus minimizing false alarms. The design covers potentially affected areas with 3 detectors with a 2

- **Response time** – The NIM system produces a criticality alarm signal within one-half second of detector recognition of a criticality event.
- **Detection** – The NIM system is designed to detect the minimum event of concern. In areas where fissionable material is handled, used, or stored, the minimum event of concern is analytically determined based on the process, materials, geometry, and process equipment present in each covered area. The minimum event of concern delivers the equivalent of an absorbed dose in soft tissue of 20 rads of combined neutron and gamma radiation at an unshielded distance of 6.6 feet (2 meters), within one minute. Only the gamma component of the total is considered for detector placement.
- **Coverage** – NIM system detector coverage is designed to detect the smallest criticality event as defined above. The location and spacing of detectors are chosen to account for the effect of shielding walls.
- **Electrical power** – The NIMS components will obtain facility power at 117 ± 15 volts AC or 102 to 132 volts AC, and a frequency range of 57 to 61 Hz from the essential power system
- **Alarm Response** – The system has been designed to produce the local criticality alarm within one-half (1/2) second of detector recognition of the minimum criticality accident of concern to enable local evacuation of the effected area. The alarm system covers all areas that may result in an absorbed dose of 12 rads or greater associated with the largest criticality event consequences.
- **Staff emergency response** – The nuclear criticality accident onsite emergency planning and response for the MFFF staff follows the guidance in ANSI/ANS-8.23-1997, *Nuclear Criticality Accident Emergency Planning and Response*. (As described in Chapter 14, an emergency plan is not required to be submitted.)
- **Emergency procedure** – The MFFF staff maintains an emergency procedure, which covers the entire facility including locations where licensed SNM is handled, used, or stored, to ensure that personnel can be withdrawn to a safe area upon the actuation of the NIM system alarm notification.

6.4 NCS TECHNICAL PRACTICES

6.4.1 Nuclear Criticality Safety Evaluations

When an MFFF component or system containing fissile materials is designed or modified that could potentially affect credible criticality sequences, an NCSE is developed or updated to determine that the entire process will be subcritical under both normal and credible abnormal conditions.

NCSEs are documented with sufficient detail and clarity to allow independent review and approval of results, and to explicitly identify the controlled nuclear and process parameters, and the associated limits on which nuclear criticality safety depends. NCSEs are only performed by qualified NCS Engineers or qualified Senior NCS Engineers. Prior to approval, NCSEs will be peer reviewed by a qualified Senior NCS Engineer or NCS Manager. The approval of NCSEs is performed in accordance with MFFF project procedures.