

SAFETY BASIS EXPECTATIONS FOR DEPARTMENT OF ENERGY DEFENSE NUCLEAR FACILITIES AND ACTIVITIES

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OUTLINE:

- **History**
- **Issues**
- **Proposed Solutions**

HISTORY

- **DOE issued Order 5480.23, *Nuclear Safety Analysis Reports*, in April 1992:**

To develop safety analyses for nuclear facilities that establish and evaluate adequacy of the facilities' safety bases, contractors should

- **Submit Plan and Schedule to DOE by October 10, 1992.**
- **Submit a Basis for Interim Operation and Preliminary Hazard Analysis.**
- **Prepare SARs in accordance with the Order and its Attachment (and later, DOE-STD-3009-94).**

HISTORY (cont.)

- **DNFSB issued Recommendation 95-2, *Safety Management*, in October 1995 - structured on lines discussed in TECH/5 and TECH/6:**
 - **Standards/Requirements Identification Documents.**
 - **Authorization Basis.**
 - **Authorization Agreement.**
 - **Readiness Certification.**

- **DNFSB issued TECH/19, *Authorization Agreements*, in April 1998.**

ISSUES

Hazard Analysis:

- **BIOs vary significantly in scope, content, quality, and completeness.**
- **BIOs are used indiscriminately for existing facilities with short-term and long-term programmatic missions, for low and high hazard facilities, and for simple and complex operations.**
- **Very few updated SARs have been prepared for high hazard facilities with long-term missions because the contractors believe:**
 - **Guidance is either too prescriptive or not enough guidance is provided.**
 - **Too expensive to prepare and not enough funding is available.**

ISSUES (cont.)

Identification and Implementation of Controls:

- **Many BIOs have the following shortfalls:**
 - **do not describe current operations,**
 - **are based on bounding scenarios,**
 - **use Evaluation Guideline of 25 rem as *criterion* for safety system classification, or**
 - **do not adequately address worker safety.**

- **Safety structures, systems, and components (SSCs) are frequently identified with little or no consideration for their existing design, past performance, quality, reliability, or functionality.**

ISSUES (cont.)

Feedback and Improvement:

- **SAR upgrade program has not benefitted from ISM implementation activities:**
 - **Authorization Agreements are signed based on existing Authorization Bases with no provision for improvement.**
 - **Feedback and improvement is reactive (e.g., USQ program) not proactive (e.g., assessment and continuing upgrade of Authorization Bases).**

PROPOSED SOLUTIONS

- *Hazard Analysis:*
 - **BIOs prepared for existing facilities with short-term missions, that are based on bounding accident analyses, need to be supplemented with Process Hazard Analysis (PrHA) of the activities being performed.**
 - **Updated Safety Analyses need to be prepared for facilities with long-term missions (to include external events, natural phenomena hazards, etc.) with effective use of existing ISM system (e.g., manuals of practice).**

PROPOSED SOLUTIONS (cont.)

- *Identification and Implementation of Controls:*
 - **Authorization Agreements, signed based on BIOs (without PrHA) as their authorization bases, need to be amended to commit to performing PrHA for identification of controls needed for worker safety.**
 - **Updated Safety Analyses (SA) need to identify safety controls (i.e., safety SSCs, TSRs, etc.) in accordance with DOE-STD-3009-94 and Board letter to DOE dated July 8, 1999.**
 - **A process is needed to ensure that administrative controls are effective replacement for other more reliable designed-in controls (e.g., admin. controls with highly reliable attributes).**

PROPOSED SOLUTIONS (cont.)

- ***Feedback and Improvement:***
 - **Safety programs currently described in Chapters 6 - 17 of a SA could be replaced (where appropriate) with reference to sections of contractor manuals prepared to satisfy ISM requirements.**
 - **A process is needed that allows DOE and its contractors to reach (and technically support) one of the following three conditions relative to each safety SSC identified in a SAR/TSR:**
 - **Complies with today's codes and standards.**
 - **Meets equivalent codes and standards.**
 - **Demonstrates acceptable reliability, despite deviations from current applicable codes and standards, accounting for past performance and maintenance of the SSC.**

**Comparison of DOE Order 5480.23 Requirements with
DOE-STD-3009-94 Recommended Contents of a Safety Analysis Report**

Topic	STD-3009-94 Chapter	DOE Order 5480.23 Paragraph 8.b.(3)
Executive Summary	Unnumbered	(a)
Site Characterization	1	(c)
Facility Description	2	(d)
Hazard Analysis	3	(e)
Accident Analysis	3	(k)
Safety Struct., Sys, & Comp.s	4	(d)
Derivation of TSRs	5	(p)
Criticality Safety Program	6	(h)
Radiation Protection	7	(I), (k)
Haz. Mat. Protection	8	(j), (k)
Waste Management	9	(g), (k)
Surv. & Maint. Program	10	(o)
Operational Safety	11	(q)
Procedures and Training	12	(m)
Human Factors	13	(n)
Quality Assurance	14	(r)
Emergency Management	15	(s)
Provisions for D&D	16	(t)
Institutional Safety Program	17	(l)