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# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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98-0001742



April 28, 1998

The Honorable Elizabeth A. Moler  
Deputy Secretary of Energy  
1000 Independence Avenue, SW  
Washington, D.C. 20585-1000

Dear Ms. Moler:

The Lawrence Livermore National Laboratory (LLNL) is engaged in the identification of requirements that it plans to propose to the Department of Energy (DOE) as the basic framework for the integrated safety management of the laboratory's nuclear program. For the site-wide set of requirements, the laboratory and DOE's Oakland Operations Office have elected to use the Work Smart Standards (WSS) process. Under this approach, an interdisciplinary team of laboratory personnel selects a set of requirements the team believes to be applicable to the work; that set is then independently reviewed by a Confirmation Team. The staff of the Defense Nuclear Facilities Safety Board (Board) recently observed the Confirmation Team's review of the WSS process at LLNL, and reviewed the subsequent report from the Confirmation Team. The staff's report to the Board is enclosed for DOE's information and use.

Based on this and previous reviews at LLNL and elsewhere, the Board questions whether the WSS process as being applied is effectively supporting the development of Integrated Safety Management System (ISMS) programs at DOE defense nuclear facilities in response to Recommendation 95-2. Several aspects merit particular attention:

- In establishing site-wide requirements, the Board has always envisioned that the safety-related requirements in the DOE directives system would serve as the common reference base. From this starting point, tailoring in accordance with hazards present at the site would ensue. Following an initial determination of applicable requirements, subject matter experts would confirm the selection and add appropriate industry or other government standards (as deemed appropriate) to ensure protection of the public, workers, and the environment. The LLNL effort does not appear to have taken this approach.

- The Board views that the underpinning of ISMS must include both technical requirements (e.g., fire protection, radiation protection) and management programs (e.g., worker protection, safety analysis, occurrence reporting). The LLNL concentrated primarily upon "technical standards." Such a subset by itself will not suffice.
- The teams selected to exercise the WSS process should be very familiar with the standards/requirements base from which the selection is to be made. This is true whether the set under development is to apply site-wide or to specific facilities or activities. Most members of the LLNL Confirmation Team were "outside experts," and although they commendably enriched the process, the majority were not well versed in existing DOE directives. Such familiarity should be a prerequisite for teams developing and confirming the adequacy of proposed requirements sets.

The product of LLNL's attempt to identify applicable requirements, pursuant to the DOE Acquisition Regulation Clause 970.5204-78 and the ISMS concept, raises questions as to the adequacy of guidance on the subject, not only for LLNL but for the related process complex-wide. The Board wished to advise you of initiatives we have undertaken to better understand this situation.

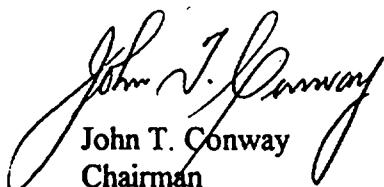
With respect to LLNL, Board Member J. J. DiNunno discussed this matter with Mr. V. Stello of the Office of Defense Programs and made available to him an advance copy of the enclosed Board staff report. Mr. Stello advised that he would explore this matter further during a trip to LLNL the week of April 19, 1998. After Mr. Stello's return, the Board plans to meet with him and Mr. R. Crowe, leader of the Safety Management Implementation Team, to discuss LLNL's path forward. The Board also wishes to meet, as soon as possible, with Mr. Stello, Mr. Crowe, the co-chairs of the LLNL Confirmation Team, and a few selected DOE and contractor personnel who have supported the WSS process at LLNL and elsewhere. The Board will work with Mr. M. Whitaker to arrange for this briefing.

With respect to complex-wide efforts, Mr. DiNunno discussed with Mr. Crowe the possible need for further guidance on the requirements/standards identification process, as well as the need to assess the adequacy of contractually-binding sets of requirements (Lists A and B) during site-wide verification reviews of the ISMS. Further, the Board plans to review the status of the processes for identifying requirements/standards at all sites with defense nuclear facilities. The Board proposes to include this topic, along with others, as part of its next public meeting on the status of implementation of Recommendation 95-2, currently scheduled for June 25, 1998. The Board has tasked Mr. M. Moury of our staff to work with Mr. Crowe in setting up the agenda and desired scope of coverage for this meeting.

Pending resolution of this matter, the Board suggests that the modification of contractual requirements at LLNL and other sites with defense nuclear facilities via implementation of the WSS concept be placed on hold.

Please call me if you have questions.

Sincerely,



John T. Conway  
Chairman

Enclosure

c: The Honorable Victor H. Reis  
Mr. Peter Brush  
Mr. James M. Owendoff  
Mr. Victor Stello  
Mr. Gene Ives  
Dr. Robin Staffin  
Mr. Richard C. Crowe  
Mr. Mark B. Whitaker, Jr.  
Dr. James M. Turner  
Dr. C. Bruce Tarter

**DEFENSE NUCLEAR FACILITIES SAFETY BOARD****DNFSB Staff Issue Report**

April 7, 1998

**MEMORANDUM FOR:** G. W. Cunningham, Technical Director

**COPIES:** Board Members

**FROM:** R. W. Barton

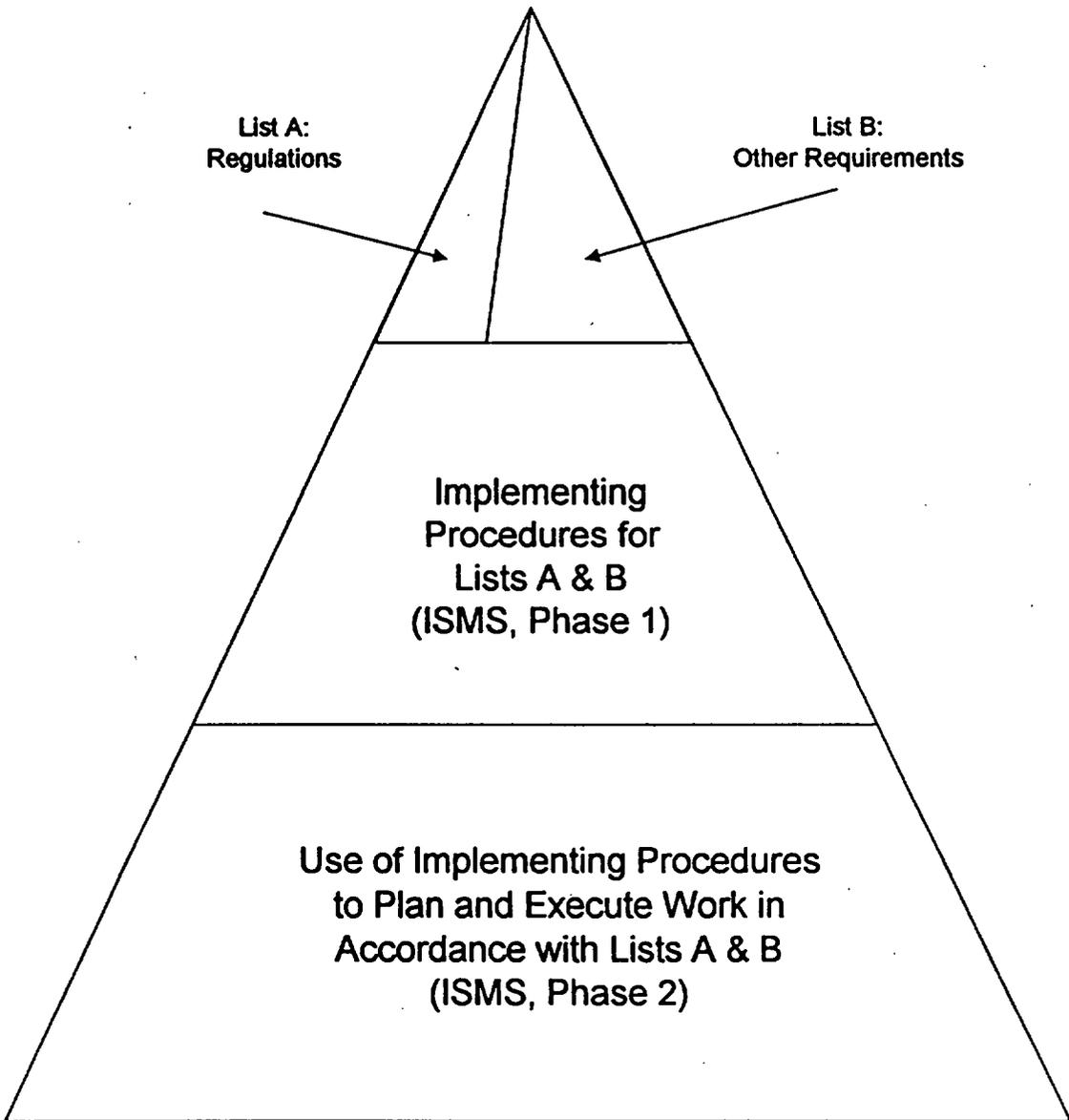
**SUBJECT:** The Work Smart Standards Process as an Input to the Development of Integrated Safety Management Systems

The staff of the Defense Nuclear Facilities Safety Board (Board) observed a Confirmation Team review of the Work Smart Standards (WSS) set identified by Lawrence Livermore National Laboratory (LLNL), conducted at LLNL March 23–27, 1998. Staff participants included Ron Barton, Jay DeLoach, Jan Preston, and Jim Troan. This report documents the staff's observations of the WSS process at LLNL, and examines the interface between the WSS process and the development and implementation of Integrated Safety Management Systems (ISMS).

**Relationship of WSS to ISMS at LLNL**

**“Ideal” Model for ISMS Development** (see Figure 1). The generation of an “ideal” ISMS from scratch would include three steps in accordance with Figure 3 of DNFSB/TECH-16, *Integrated Safety Management*:

- 1) Selection of a set of **requirements** for inclusion in the contract that (if implemented) would provide adequate protection of the public, workers, and the environment. This set includes List A, which consists of legally binding requirements (e.g., regulations, statutes) and List B, which consists of guidance the Department of Energy (DOE) and the contractor determine must be made binding to provide adequate protection. List B, which is required by Department of Energy Acquisition Regulation Clause 970.5204-78, can be either DOE directives (currently in many contracts), a Standards/Requirements Identification Document, or the result of a WSS process.
- 2) Development of a set of **implementing procedures** that (if used to plan and execute work) are adequate to ensure that all List A and List B requirements will be met (the subject of a DOE Phase 1 verification review).
- 3) A **requirement to use implementing procedures** to plan and execute all work at the institution (the subject of a DOE Phase 2 verification review).



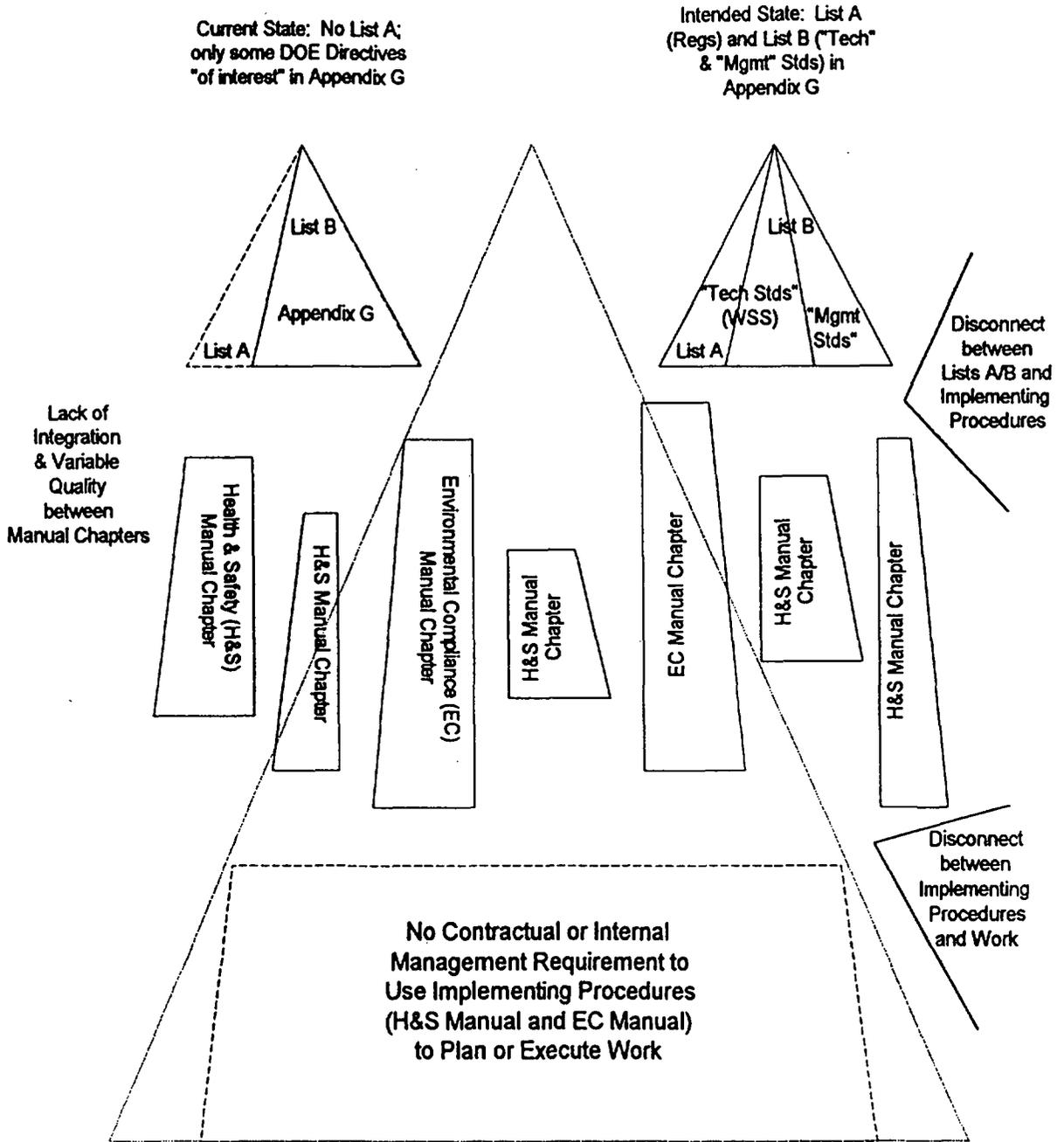
**Figure 1. Ideal ISMS Model**

**Deviation of ISMS at LLNL from “Ideal” Model Development.** The development of ISMS at LLNL deviates from the above ideal model in the following ways (see Figure 2).

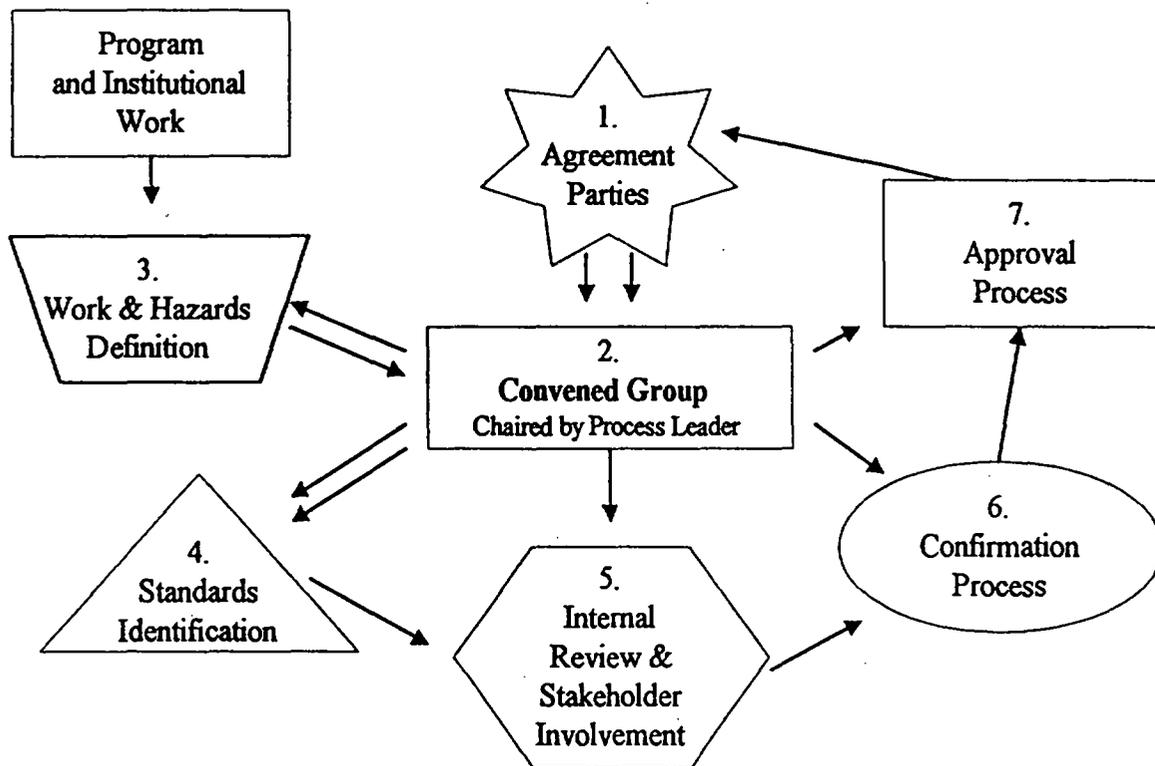
- 1) **Requirements.** The contract between DOE and the University of California for the management of LLNL currently includes a list of requirements in Appendix G. This appendix consists of a list of DOE directives that are currently binding at LLNL; it includes no List A of legally binding requirements. The WSS process executed at LLNL identified List A documents and those “technical standards” that were considered necessary to address the hazards of the entire scope of work at the laboratory. LLNL indicated that the WSS process did not impact a set of “management standards” that is currently included in Appendix G. These latter “management standards” include DOE Orders 5480.21, 5480.22, and 5480.23, as well as other directives, including those Orders related to accident investigations and occurrence reporting. DOE’s directives have been developed over time to represent DOE’s expectations of how certain essential ISMS-related programs are to be conducted. LLNL indicated that the continued inclusion of these “management standards” would be reconsidered as the LLNL ISMS development process progresses.
- 2) **Implementing Procedures.** The WSS process does not implement or confirm implementation of the WSS set. Based on the staff’s knowledge of LLNL, the laboratory’s current institutional safety programs (represented primarily by the *Health & Safety Manual* and the *Environmental Compliance Manual*) are not explicitly or comprehensively derived to implement the current Appendix G requirements. LLNL efforts are under way, and reportedly will continue after the WSS process has been completed, to (1) ensure that the LLNL manuals truly implement the contractual requirements, and (2) better integrate the various manual chapters into an effective ISMS.
- 3) **Required Use.** During previous visits to LLNL, the Board’s staff observed that there is no existing contractual or internal management requirement to use the LLNL safety programs/manuals to plan or execute work. Therefore, implementation of legal and contractual requirements cannot be ensured. At present, there is no plan to create a binding requirement (either by DOE or internal to LLNL) to use the LLNL manuals, even after the WSS process has been completed and the ISMS has been produced on paper as a mechanism to implement the contractual requirement set.

### **LLNL’s Implementation of WSS**

An overview of LLNL’s WSS process, as provided to the Confirmation Team, is shown in Figure 3. Although the process and personnel involvement were not consistent throughout the organization, LLNL attempted to do a comprehensive job of identifying a set of work and hazards representing the entire scope of work at the site. The wide involvement of programmatic



**Figure 2. Current State of ISMS at LLNL**



- \* 1) DOE Manual 450.3-1 "The Department of Energy Closure Process for Necessary and Sufficient Sets of Standards", 1-25-96
- 2) LLNL WSS Charter

**Figure 3**

and safety support personnel in this effort may facilitate the implementation of a requirements-based ISMS at LLNL. However, WSS documentation given to the Confirmation Team was incomplete and inaccurate, and LLNL personnel involved with the WSS process were not consistently made available to the Confirmation Team members early in the review week. Both of these deficiencies hindered the progress of the Confirmation Team's review.

The WSS process developed a representative set of WSSs for all LLNL facilities; facility-specific WSSs were not identified. LLNL indicated that the WSS process satisfied the first two ISMS core functions (define work and analyze associated hazards). However, the WSS process identified only generic hazards, not those that would be identified as part of a more detailed hazards analysis.

LLNL developed four "local standards" because it was judged that no existing DOE or industry consensus standards were adequate or appropriate. Preliminary review of two of these documents by the Board's staff (Ergonomics and Pressure Safety) revealed general requirements and a lack of sufficient detail.

Completing the development and institutionalization of the ISMS program at LLNL will be part of LLNL's ongoing ISMS effort. The staff believes that effective utilization of the results of the WSS process will be difficult if the WSS process, evaluations, decisions, and results are not clearly documented, and key WSS process personnel do not remain available to support ISMS program development and implementation.

### **Confirmation Team's Review**

The Confirmation Team was composed of competent industry and DOE experts in nuclear safety, health physics, industrial hygiene, industrial safety, and environmental protection (see Attachment 1). The insights the team brought to bear on the LLNL WSS process were considerable. The team's charter, consistent with DOE Manual 450.3-1, was to review the information produced by the LLNL WSS effort, determine whether the set of WSS is adequate and feasible, and document their activities and results. The Confirmation Team provided a value-added review and a report, reviewed by the Board's staff, that identified approximately two dozen additional requirements for inclusion in the WSS set, the need for adequate documentation of the WSS process and results, and numerous errors and inconsistencies in the documentation. The LLNL Standards Identification Team convened in special session on Friday, March 27, 1998, and accepted all of the recommended additions to the WSS set.

LLNL had structured the WSS confirmation scope to be limited to "technical standards." However, the Confirmation Team obtained LLNL's clarification, and documented their understanding, that the "management standards" in the current contract would remain in force when the WSS set is approved. Furthermore, the Confirmation Team report contained suggestions that a crosswalk be developed, comparing old requirements in Appendix G with any new WSS set replacing them to ensure that necessary safety requirements are not lost, and that a

justification for removing existing requirements be developed. The Confirmation Team's report also suggested that "the WSS and/or ISMS process should include a cross-walk table which shows the disposition of the '52 High Interest DOE Orders' into those that will remain intact and those that have been replaced by other standards..."

During one tour, the Board's staff observed a member of the Confirmation Team identifying significant examples of noncompliance with Occupational Safety and Health (OSHA) requirements. A senior local DOE manager confirmed that LLNL's worker protection record has been repeatedly below acceptable levels, and a senior LLNL manager indicated the laboratory's intent to move up the schedule for a proposed OSHA-focus appraisal by outside experts.

### **Issues for Future Consideration**

The ultimate disposition of the current set of contractual requirements in LLNL's Appendix G is unclear. Particularly uncertain is the disposition of the "management standards" excluded from the WSS process, which are reportedly to be addressed during ISMS development. It appears advisable to request more concrete information on the impact of the WSS process on Appendix G; LLNL appears to be the only source for this information.

The approach that LLNL will follow to use their ultimate contractual requirements set as an input to institutional ISMS development is also unclear. The Board's staff will continue to follow ISMS development at LLNL to ensure that contractual requirements are appropriately integrated into the ISMS development activity. The staff also intends to develop a better understanding of how the Los Alamos National Laboratory executed the WSS process, and how they are progressing with development and implementation of ISMS in accordance with their contractual requirements set, which includes the results of a WSS process.

The LLNL Confirmation Team report contained a number of comments and suggestions, in addition to their identification of requirements to be added to the WSS set (what the Team termed "exceptions"). The Board's staff will need to track LLNL's response to these comments, including the suggestion that a requirements "cross-walk table" be prepared, as their resolution will potentially impact follow-on ISMS development efforts.

Observation of the Confirmation Team's efforts raised questions about the WSS process that are broader than just its application at LLNL. The WSS process' bottom-up approach to identifying "technical standards" for generic work and hazards does not appear designed to yield contractual requirements that would compel the Laboratory to develop and implement essential ISMS core function programs (as described in several of DOE's directives). Even the most competent Confirmation Team will find it hard to determine whether a "technical standards" set will be adequate, if they are not able to review the "management standards" infrastructure that exists to implement the WSS set. Since the WSS process seems to discourage looking at the essential elements of safety management as an integrated system, it is unclear how effective the WSS process will serve as an input to ISMS development efforts.

Attachment 1

**Work Smart Standards Confirmation Team**

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LBNL  
ES&H/Management

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Westinghouse Electric Corp.  
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Robert B. Doremus  
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Dennis J. Erickson  
ESH Division Director  
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Angelo Giambusso  
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David A. Herbert  
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Dwight R. Hoenig  
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Thomas P. McLaughlin  
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Bryce L. Rich  
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Health Physics

John M. Rosenow  
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