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THE WORK SMART STANDARDS* PROCESS AT JEFFERSON LAB†‡

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The Thomas Jefferson National Accelerator Facility (Jefferson Lab) has developed a set of Work Smart Standards for the Lab. The effort incorporated the Lab's performance-based contract into the Necessary and Sufficient (N&S) Standards identification process of the DOE. A rigorous protocol identified hazards in the workplace and standards that provide adequate protection of workers, public, and the environment at reasonable cost. The intensive process was a joint effort between the Lab and DOE and it required trained teams of knowledgeable experts in three fields: 1.) actual required work conditions at Jefferson Lab; 2.) laws, regulations, DOE directives and performance-based contracts; and 3.) Environmental Health and Safety (EH&S), Rad Con, and QA. The criteria for selection of the teams, the database designed and used for the process, and lessons learned are discussed.

INTRODUCTION

DOE Standards

In August, 1994, the Department of Energy Standards Committee (DSC) issued *Criteria for the Department's Standards Program* (1). This document states the DOE's commitment, presents the rationale, and establishes 10-point Standards Program Criteria. The focus of this program is Environment, Health, and Safety (EH&S) and includes radiation health.

An important distinction of this effort is that it all starts at the work level rather than at a "head-quarters" level. Based on the actual work, hazards associated with the work are identified. Based on the resulting identified hazards, standards are identified that provide adequate protection of the workers, public, and environment.

A standard is deemed "Necessary" if it is a legal requirement (e.g., federal, state, or local law or regulation, or Executive Order). A standard is deemed "Sufficient" if it is needed to reduce the

risk of the hazard to an acceptable level. Sufficient standards can be external (to the laboratory, e.g., ANSI, local building codes, or ICRP) or internal (developed specifically by and for a facility, such as a procedure).

Using this philosophy, the DOE launched nine pilot programs including the ground-breaking Fermilab pilot effort.

Fermilab Pilot

On February 9, 1995, the Fermilab Necessary & Sufficient (N&S) pilot was launched. The strict protocol established by the DOE was followed: A steering committee, called the Convened Group, was appointed by the Agreement Parties, DOE and Universities Research Association (URA); a Standards Identification Team (ID Team) - appointed by the Convened Group and composed of knowledgeable individuals at Fermilab, sister laboratories, and the DOE - identified the work, work-based hazards, and the mitigating hazards-based standards; a Confirmation Panel reviewed the results of the pro-

* Formerly known as "Necessary & Sufficient."

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‡ Formerly the Continuous Electron Beam Accelerator Facility (CEBAF).

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cess to certify that the protocol was followed; and finally, based on the resulting N&S Set of Standards, the URA contract with DOE was modified.

DOE/SURA* N&S

The U. S. DOE is the largest civilian contracting agency. In 1994, a Contract Reform Task Force examined the agency's unique contracting system as part of the current Administration's efforts to reinvent government. The resulting report recommended reforms that included changing from a "compliance" contract to a "performance" contract.

Subsequently, SURAs DOE contract was substantially modified to include a set of performance metrics by which the laboratory would be measured. These performance metrics include, for example, *Beam availability* measured by percentage of the scheduled time for which the beam is useful, with an asymptotic goal of 80%, and *Amount of unnecessary low level radioactive waste and unnecessary hazardous waste generated*.

At DOE's request, SURA and DOE negotiated and chartered the N&S process at the Lab such that it would accommodate the DOE/SURA performance based contract. The contract contains performance metrics for EH&S whose use is legally binding and hence satisfy the "Necessary" criteria.

Following the process chartering on December 6, 1995, the process leader and Identification Team were selected and chartered using the protocol recommended by the DOE in the N&S training classes conducted by the Department's Environmental Health (EH) Division. Most of the Lab's Team members either had previous N&S experience or N&S training, or both, including the first author, who served on the Fermilab ID Team.

The previous N&S experience of Team members helped get the Team off to a running start. Substantive deliberation began at the first meeting by deciding to build on two previous efforts: 1.) The extensive hazards-based EH&S Manual of the Laboratory in the identification of all work hazards at the Laboratory, and 2.) The Fermilab Hazard Issue nomenclature and database.

Once the hazards were identified, standards were researched using the Fermilab Set as a start-

ing point. Non-Virginia state and local regulations, and non-Jefferson Lab specific hazards (e.g., Fermilab specific hazards), were removed from the initial database. Virginia and Jefferson Lab specific standards were added.

The Team did not accept at face value any Fermilab standard as applicable to Jefferson Lab. It examined each standard and consulted with Subject Matter Experts (SMEs) whenever needed. The Team found that, due to the nature of the SURA/DOE contract, certain Code of Federal Regulations (CFRs) were not applicable to Jefferson Lab. In reaching this conclusion the Team researched the contract, contract law, and contacted federal agencies for applicability determinations.

The Team constantly reminded itself of its chartered focus throughout its deliberations. Only hazard-based standards were considered; non-hazard-based standards, such as documentation or reporting requirements, were not. Figure 1 gives a representation of the relationship of standard categorization.

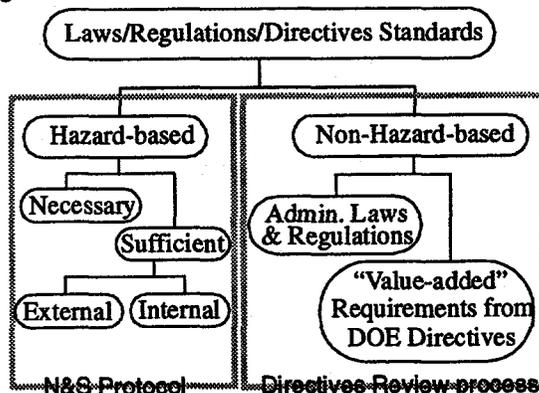


Figure 1. Categories and relationships of WSS.

Input to the process was solicited from Laboratory stakeholders. Stakeholders ranged from the on-site employees to the Users community conducting experiments and from the local Emergency Rescue Squads and Hospitals to School Districts. All responses were addressed by the Team.

The results of the Team's efforts were presented to a Confirmation Panel on January 29, 1996. Panel membership - specified in the N&S Charter - consisted of members of the Convened Group and representatives from Fermilab, Brookhaven, and

* Southeastern Universities Research Association, which manages Jefferson Lab for the DOE.

SLAC. Based on the Panel's report, the Jefferson Lab Necessary and Sufficient Set of Standards was accepted and approved by the Agreement Parties on February 15, 1996.

DIRECTIVES REVIEW PROCESS

The successful N&S process, however, did not result in a contract modification at that time, as happened at Fermilab. Most of the EH&S requirements in the contract (in the form of DOE Orders) were not hazard-based. SURA and DOE agreed to apply the N&S methodology to all non-hazard-based EH&S requirements in the contract, most of which were contained in 31 EH&S related DOE Orders specified in the contract.

The N&S ID Team was re-assembled and renamed the Directives Review Team. Its charter was to apply the N&S methodology to the non-hazard-based requirements in the contract. While the N&S Team could build on previous work, the Directives Review Team needed new working rules and processes based on the precepts of N&S.

For example, in order to adequately account for the disposition of any given requirement, new criteria were needed to classify each requirement in the contract, including each DOE Order. New Orders from the DOE, that cancelled old Orders but retained old Order requirements, were also included in the effort. A crosswalk between new, old, and cancelled Orders was also needed. The crosswalk resulted in 19 Orders to review.

The Team established a two stage filter process:

1. Examine all requirements of the EH&S related Directives in the contract that are applicable to the Jefferson Lab site - either for DOE or SURA - and categorize each as: applicable to the DOE, based in law or regulation, not applicable to a low-hazard non-nuclear accelerator facility, applicable to Jefferson Lab (but not based on law or regulation), or cancelled without replacement. Compile a list of Administrative Laws and Regulations.
2. Examine all requirements applicable to Jefferson Lab but not based on law or regulation and perform a "net benefit" evaluation. Compile a list of only those requirements for which there was a true net benefit. Requirements in the resulting list are deemed of sufficient value to be included in any contract modification that

removes the EH&S DOE Directives. The list is recommended to the Contract modification team for consideration and disposition.

The Team established a database that captured all the essential features of each requirement. This included the citation (DOE number, section, paragraph, etc.), the full text of the requirement, the basis (law or reg if applicable), DOE comments, and Remarks.

The Team identified over 1500 requirements in 19 EH&S related Orders in the DOE/SURA contract. Figure 2 shows final distribution of requirements classifications after the Team's deliberations. These results clearly show that it is inappropriate to include over half of the requirements in the SURA/DOE contract. Furthermore, since 39% are already required by law or regulation, it is redundant to include them in the contract; Jefferson Lab must do them anyway.

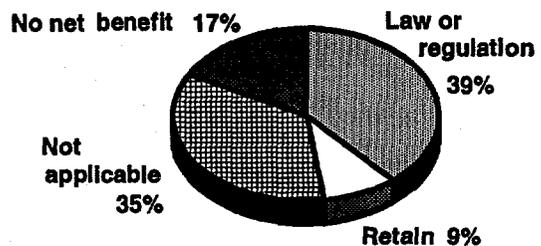


Figure 2. Classification results of ~1500 EH&S requirements after the Directives Review process.

Even though only 9% needed to be specifically included in the contract language, it is also clear that the laboratory still must abide by almost half of the total examined. There is not a one-to-one correlation between reduction in non-hazard-based requirements and reduction in actual EH&S work load (which is primarily hazard-based).

CONTRACT MODIFICATION

Simply categorizing requirements as shown in Figure 2 would be a waste of resources unless the contract containing those requirements was modified appropriately. The 9% "Retain" set was submitted to a Contract Modification Team for disposition, either to be captured by a performance metric or to be specifically included in the contract modification.

A special joint DOE/SURA contract modification team examined the submitted set and negoti-

ated the best method for accomplishing this task. A two-stage process was adopted: First, SURA and DOE agreed to contract modification No. 119 (September 9, 1996) deleting the 31 EH&S related DOE Orders and incorporating the N&S Set and the recommended requirements. Second, SURA and DOE agreed to incorporate the recommended requirements in future performance metric refinements.

LESSONS LEARNED

Aside from the main outcome of a welcomed contract modification, there were many lessons learned; some are laboratory-specific, others are more global in nature. The following is a synopsis of the major lessons learned.

1. Select smart people that can work together as a "learning organization," as described by Senge (2). Team members must be able to "see the forest *and* the trees." Expertise in EH&S professional disciplines must be applied within the context of all the interrelated systems at a national laboratory. Furthermore, each member should have the ability and willingness to discuss, debate, and build consensus on individual requirements or issues under deliberation. Finally, members should be able to learn in the process. (The technician on our team gained an enormous amount of insight into how the law and regulations are applied. DOE Team members gained greater appreciation for the actual day-to-day activities and professionalism of lab staff.)
2. Know the law and your contract but be inquisitive. For example, the Team found some requirements that appeared, at first reading, to be applicable to Jefferson Lab, but when examined thoroughly, were found not to be.
3. Charter the process and maintain a focus on the task at hand. This was essential for sticking to a tight schedule.
4. Do what is needed, not what is perfect. This is the hardest lesson for physicists, engineers, and administrators alike to master. There was no need to "re-invent the wheel," and the Team built upon the previous hazard-based efforts of the laboratory's EH&S Manual (3) and the N&S results of Fermilab (4).
5. Use an independent facilitator. Issues that involve the law and the safety of people can

generate more emotional or irrational responses than issues that involve the performance of an accelerator or an experiment. By using a facilitator and setting aside difficult issues for resolution at special working sessions - sometimes held off-site - Teams were able to reach consensus and resolve all such issues.

SUMMARY & CONCLUSIONS

Jefferson Laboratory has successfully conducted the Work Smart Standards protocol of the DOE. This effort identified hazards associated with actual work at the laboratory, and identified the necessary and sufficient standards that would, if appropriately applied, adequately protect workers, the public, and the environment at reasonable cost. Furthermore, by extending the approach to DOE Directives, the Laboratory identified applicable non-hazard-based requirements, such as documentation and reporting requirements, and retained only those with a net positive benefit in its performance based contract. In the true spirit of reducing regulatory burdens many requirements have thus been eliminated from the contract. The retained requirements were either already codified in law or regulation or incorporated into a modification of the performance based contract between SURA and the DOE.

An effort is currently underway to examine actual EH&S practices at Jefferson Lab in order to optimize performance.

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REFERENCES

1. DOE/EH-0416, *Criteria for the Department's Standards Program*, U. S. Department of Energy, Office of Environment, Safety and Health, August, 1994.
2. Senge, P.M., *THE FIFTH DISCIPLINE*, New York NY, Doubleday Currency, 1990, pp. 373-377.
3. http://www.cebaf.gov/services/ehsinfo/manual/ehsrev1_1.html
4. http://www-esh.fnal.gov/N_S/Final_N_S_Report.html