

INTEGRATED SAFETY MANAGEMENT

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FOR PRESENTATION TO

ENERGY FACILITY CONTRACTORS GROUP

AT

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ARLINGTON, VA**

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I am glad to have the opportunity to meet and talk with this gathering of Energy Facility Contractors. We share a common task—working to support the mission of the Department of Energy. Much of that mission today is the clean-up of the hazardous residuals of the weapons program. These are frequently referred to as legacy wastes. Wastes, and the opportunity for their safe management and disposition however, are not the only legacy you have inherited. You are the successors of those contractors such as Dupont, Westinghouse, General Electric, Philips Petroleum, and Union Carbide who came forward in a period of national peril to place their research and development and industrial expertise at the disposal of the Federal Government.

While in hindsight, the use of radioactive materials that marked their activities might have been managed with less environmental impact, those contractors developed the underpinning of safety practices that enabled the use of such materials to become not only the deterrent that the nuclear weapons represent, but also the many peaceful applications they serve. Some, like Dupont, brought to the nuclear safety industry practices that reflected lessons learned in the handling of conventional explosives and other hazardous materials. Industry standards for doing work safely at the time were enriched by practices found necessary for radiation safety. Engineering of process systems and biological effects of exposures to radiation proceeded as complementary programs. The establishment of radiation protection requirements made incumbent upon users of nuclear materials, both by the weapons establishment and commercial sector, resulted largely from the lessons learned and research of federal authorities, national and international but, were adopted, not set by government, from recommendations of the National Commission on Radiation Protection (NCRP) and the International Commission on Radiation Protection (ICRP). All nuclear safety engineering standards stem from practices intended to ensure that these radiation protective limits for protection of people are not exceeded. You who are the current group of contractors helping the Department of Energy fulfill its mission, are beneficiaries of this legacy of safety practices. It is yours to use in ensuring the protection of the public, workers and the environment, but the opportunity to carry on the work of your predecessors also carries with it the responsibility to maintain and enrich this legacy of good practices and to foster the safety culture that is so important to the achievement of the kind of protection we all seek.

My experience in the nuclear safety field dates back to 1956. Over the years since then, we have seen the requirements for ensuring safety as stated in the Atomic Energy Act of 1954 enlarged greatly by statutes that cover non-nuclear toxic and hazardous substances, the emission of hazardous materials to air, water and soils, and environmental protection in general. Industry has had to respond not only for the commercial sector but government as well. While the government administers this body of protective statutes by parts, industry must integrate the response actions required if work is to be done. Unfortunately, in my view, too often such integration is not well done; statutory requirements established by parts are being addressed by parts.

In 1995, the Defense Nuclear Facilities Safety Board initiated an action through its Recommendation 95-2 to the Secretary of Energy to cause DOE to move toward an Integrated

Safety Management (ISM) concept. It is very important for the Energy Facility Contractors Group (EFCOG) to understand this concept because DOE has moved to establish Integrated Safety Management Systems as a requirement incumbent upon all its major contractors. The DOE has issued a policy statement P450.4, *Safety Management System Policy*, declaring Secretarial commitment to the concept and expectations that DOE nuclear programs will be structured accordingly. The requirement is now specified in the Department of Energy Acquisition Regulation (DEAR clause 970.5204-2, *Integration of ES&H into Work Planning and Execution*).

Let me talk to you briefly about the Integrated Safety Management concept, where the implementation efforts stand to date, but more importantly what this contractors group might do to help make it a reality. Our mutual objective, I submit should be to move in the near term to a higher level of safety assurance and to set in place a system that continues to improve from building upon the lessons learned in endeavoring to do work safely. In so doing we will contribute our bit to the enrichment of safety culture our predecessors fostered.

The essence of Integrated Safety Management as the Defense Board envisioned it is described in Tech Report DNFSB/Tech-16, *Integrated Safety Management*, dated June 1997. DOE has also issued Guide DOE G450.4-1, *Integrated Safety Management Systems Guide*. These documents have been around for sometime. I assume you are familiar with them. If not, take the time to become so. More important, perhaps, for you who are senior managers of energy facility contracts is to understand some of the safety philosophy upon which these guidance documents are based and the areas where contractors must act judiciously to make the system work. Doing work safely is the end objective. Integrating work planning and safety planning is the basic approach; work plans that include safety measures tailored to the hazards of the work are the desired product of that approach. Work done safely is the desired end result.

In the end, the safety management of the hazardous work of DOE must be done by you, the contractors, not the Federal work force. Hence, you should, and do, have a major role in determining how that work will be done. This has always been the case, but what is being offered in the way of the Integrated Safety Management concept is a better defined structure for establishing the safety management program that you and DOE agree is appropriate for the work being performed. Let me discuss some of the main features of that structure.

1. **Applicable Requirements.** Safety practices that have evolved over the years have been captured in a variety of government and industry standards. Those generally applicable to activities required for DOE's mission are specified by rule and contracts. However, under the ISM concept, it is recognized that "one size does not fit all." You, the contractor have both the opportunity and the responsibility to work with DOE to establish that set of requirements, government and industry, that will be the basic safety framework for performing the work you have been contracted to do. This is no trivial task. Once agreement is reached as to what site-wide requirements are to apply, you are expected to establish manuals

of practice delineating how they are to be satisfied. Requirements so identified become contractually binding both on prime and sub-contractors. (Reference: Figure 3, DNFSB/TECH-16)

2. **Integration of Hazards Analysis and Derivative Control Measures.**

Protection of the public, the workers, the environment and property, both private and government, must be ensured. Protective measures for these various sectors are prescribed by different statutes and regulations and administered by different government agencies. You have the chore of bringing to bear at the work place the integral sum of this diversity. As you are well aware there has developed in the engineering profession over the years the tendency toward specialization just as in the medical profession. While specialization has much to say for it, its prevalence requires management skills to fashion and direct the interdisciplinary teams needed to plan and perform work as an integrated whole.

The nuclear industry is marked by its pre-occupation during its early years with the potential for accidental radioactive releases that could cause substantial off-site damage. Practices for analyzing both probability and consequences of such accidents and designing preventive and mitigating systems are well established. On-the-other hand, practices for ensuring safety in the work place—occupational safety—are not nearly so well established or executed. This is the single most important area, where contractors have both the skill and the responsibility for ensuring safety. Those of you who are the prime contractors at a site have the special responsibility (1) to bring to the work place the skills of the corporate entity that enticed the government to hire you in the first place and (2) to ensure that your effective practices or approved equivalents are used by all sub-tier contractors.

The work control process at DOE's sites is probably the single, most important safety process you contractors must perform well. This process must integrate considerations of all the hazards that the work entails, whether electrical, mechanical, chemical, or nuclear. No one work control process is likely to fit all work tasks equally well. The exercise of judgement is required. Planners must be carefully selected and trained to lead such efforts and provided the interdisciplinary help needed to examine each task and to identify necessary safety control measures. Tailoring control measures to the specific hazards of operations, whether nuclear and/or non-nuclear and whether at the facility, activity or task level is a fundamental feature of Integrated Safety Management.

3. **Tailoring.** Any system for safety management of the diverse activities that DOE's mission requires must be comprehensive enough to envelope all of them, yet be flexible enough to fashion a set of control measures unique to each. Contractors are expected to tailor control measures to the hazards of the activities being

conducted, whether they be design, construction, operation and maintenance, or decommissioning. Tailoring offers the opportunity to structure control measures you deem necessary but also lays upon you the responsibility for ensuring adequacy. This is particularly true for worker protection. (Reference: Figures 10 & 11, DNFSB/TECH-16)

Having stressed a number of the key underpinnings of Integrated Safety Management, let me share with you some of the happenings that I perceive could affect your delivery of contracted services to the government.

1. **Contract Reform.** Performance-based contracting: these are the buzz words that are heard more and more frequently. One document I recently read (National Academy of Public Administration Report, *Ensuring Worker Safety and Health Across the DOE Complex*, January 1997, pages 60-64), asserts that performance measures specified in contracts will serve as a substitute for the standards-based safety management program now prescribed by DOE safety-related directives. As either the beneficiary or cross bearer of the results of contract reform initiatives, a group such as EFCOG, acting in unison, could well analyze the potential results of proposed reforms and advise DOE accordingly.
2. **DOE Directives.** DOE Directives are an eclectic set of Rules, Policies, Orders, Standards, and Guides. This body of practice appears to be ever in some state of flux. EFCOG as a group might well review and comment on the appropriateness and adequacy of these, particularly as changes are made. The development of new technical standards by Federal Agencies, has been inhibited by Congressional action (National Technology Transfer and Advancement Act of 1995, Pub. L. No. 104-113). This act requires use of industry standards to the extent they are applicable. EFCOG could well serve an identifier of industry standards that are most appropriate for various aspects of their work for DOE. Results of such efforts could well feed into the establishment of reference requirements (*list B*) per DOE's Acquisition Regulations. (DEAR clause 970.5204-78)
3. **External Regulation.** The Department of Energy has been considering for some time the cost/benefits of divesting itself of responsibilities for establishing and enforcing nuclear safety requirements as assigned by Congress under the Atomic Energy Act of 1954 and subsequent amendments. A number of studies have been performed over the past four years and a number of current pilot programs are underway involving the Nuclear Regulatory Commission (nuclear safety) and the Department of Labor's Occupational Health and Safety Agency (worker protection). There is some interest in Congress on this matter. This is evident in the report by the House Appropriations Committee on Energy and Water for FY 98 wherein is stated that:

“The Committee is aware of the joint efforts by the Department of Energy (DOE) and the Nuclear Regulatory Commission (NRC) to evaluate costs and benefits of transitioning from DOE self-regulation to external regulation by an independent regulatory entity overseeing the nuclear health, safety and security of DOE nuclear activities and facilities. The Committee strongly supports this effort, and understands that initially three to five pilot projects will be identified for NRC regulation. The DOE and NRC should keep the Committee fully informed of these efforts.

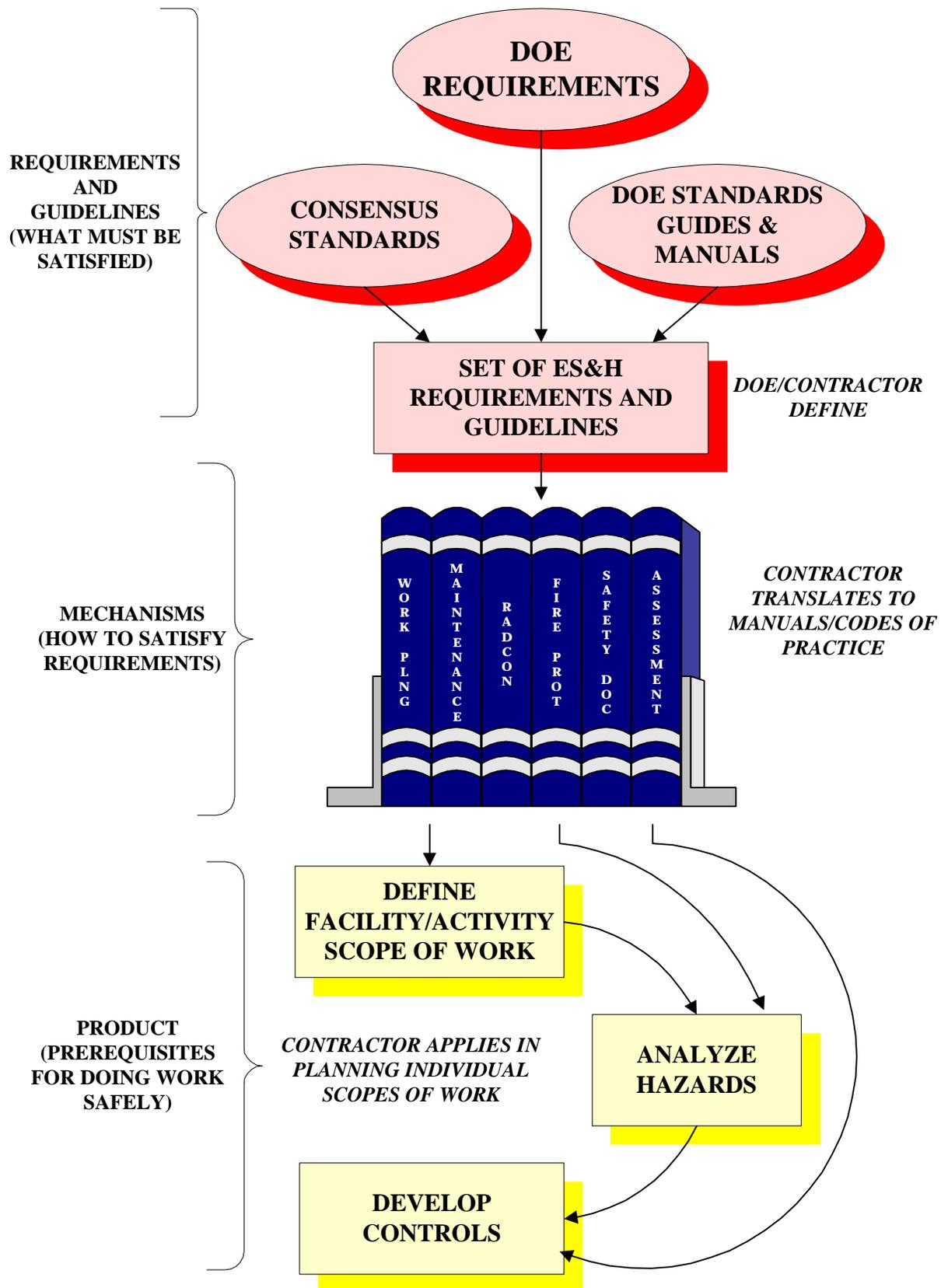
In anticipation of future regulation of DOE nuclear facilities, DOE is directed to ensure that starting in FY 98, all new nuclear facilities are constructed in accordance with Nuclear Regulatory (NRC) licensing requirements.”

Further, the National Defense Authorization Act for FY 98 signed into law November 18, 1997, included a provision that requires the Board to:

“ . . .prepare a report and make recommendations on its role in the Department of Energy’s decision to establish external regulation of defense nuclear facilities.”

Whatever the merits perceived by advocates of external regulation, they will add up to a more complexed regulatory regime than currently exists. EFCOG represents the industrial sector that will be most affected. To my knowledge, your sector has not yet weighed in on the arguments pro and con on this matter. In my view, you should not stand aside and await developments on this issue. I urge you to become informed and become involved.

4. Key Personnel Assignments. Contract performance is highly dependent upon the skills of the key staff dedicated to the work. The natural tendency in the competitive market place is to take star performers and move them out to new assignments. After all, that is what companies sell—the talent of staff. Of course, such re-assignments are also made to reward individuals for exceptional performances by giving them new, more challenging opportunities. These motives, notwithstanding, it is extremely important that corporate management bring the best of its resources to bear on these programs that are costing the public billions of dollars to support. The viability of DOE’s programs, so dependent upon Congressional confidence in receiving value for money allocated, is at stake.



Standards-Based Safety Management
Figure 3

Authorization Protocols

INTEGRATED SAFETY CONTROL SET*				
	Safety Sector	Hazards Assessment	Hazards Controls	Authorization Protocol
Macro Level	Public	SAR and Graded Equivalents DOE Orders 5480.23	Technical Safety Requirements: <ul style="list-style-type: none"> • Design (Engineered Controls) 	<ul style="list-style-type: none"> • Authorization Agreement - High/Moderate Hazards Facilities Category 1 and 2
	Worker Sector A	Process hazards Analysis: 29 CFR 1910.119, Risk Management Program; 40 CFR 68	<ul style="list-style-type: none"> • Work practices and administrative procedures 	<ul style="list-style-type: none"> • Authorizing Correspondence Moderate/Low Hazards Facilities Category 3 and 4
Micro Level	Worker Sector B	Job Hazards Analysis and Equivalents DOE Order 440.1 IG 440.1-1	Work Control Conditions: <ul style="list-style-type: none"> • Engineered Controls • Work practice and administrative procedures • Personnel Protective Equipment 	<ul style="list-style-type: none"> • Rad Work Permits • Work Control Permits • Operation Procedure
	Environment	NEPA Documentation Permit Support Documents	Discharge Control: <ul style="list-style-type: none"> • Engineered features • Limits on discharges 	Discharge Permits <ul style="list-style-type: none"> • air • water • solid wastes

* Safeguards and Security not included

Figure 10.

Integrated Safety Control Set							
Safety Sectors	Engineered Design Features ¹	Admin. Controls ²	Work Practice ³	Personal Protective Equipment	Skill of the Trade		
Public	Red	Red	Red	Red	White	White	Red
Worker (High Risk Task)	Pink	Pink	Pink	Pink	Pink	Pink	Pink
Worker (Moderate Risk Task)	White	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Worker (Low Risk Task)	White	White	White	Green	Green	Green	
Environment	White	Blue	Blue	Blue	White	White	
Facility	White	Purple	Purple	Purple	White	White	

¹Engineered Design Features are equipment, systems, structures and components identified in the hazards analysis as needed to prevent or mitigate the hazards. Those in zones red and pink are subject to more stringent quality assurance provisions than those in zone yellow.

²Administrative controls consist of those controls identified in the TSRs and any other controls administered by the contractor; including two-man rule, work schedule, and man power restrictions to reduce the operational risk.

³Work practice controls alter the manner in which a task is performed. Some examples of work practice controls include: Procedural controls to incorporate steps for worker protection, mockup training, incorporation of good radiological work practices.

Figure 11.