USE OF A PRELIMINARY REQUIREMENTS IDENTIFICATION DOCUMENT (PRID) DATA BASE TO IDENTIFY FACILITY DOCUMENTS AND COMPONENTS AND TO ESTABLISH AN "OPERATING ENVELOPE"

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ABSTRACT

A challenge that arises consistently throughout the U.S. Department of Energy (DOE) arena is difficulty in identifying the regulatory requirements for the unique operations of a given facility in a cost-effective and consistent manner. This challenge is further compounded by the hundreds of regulatory documents/statutes that must be assessed, as mandated by specific DOE Orders or facility components. As the missions of selected DOE facilities evolve or change, it is becoming of paramount importance to readily identify each affected facility's current "operating envelope" (i.e., what regulatory requirements documents are applicable, based upon facility operations and/or programs), to aide in cost projection and scheduling efforts for mission changes. The ability to determine a facility's current operating envelope will also greatly aid in environmental restoration and/or decommissioning efforts because regulatory concerns/issues and facility-specific processes will have already been identified.

To date, each DOE facility, or group of facilities, has attempted to establish an operating envelope without using a consistent strategy or methodology. This, in turn, has led to facility reviews that vary widely. For instance, not all DOE Orders are being addressed, code requirements are not being identified for facility processing systems required to support operations, and there is no consistent format or structure for a final report.

To address this need, the Uranium Mill Tailings Remedial Action (UMTRA) Project personnel have developed an electronic Preliminary Requirements Identification Document (PRID) data base.

INTRODUCTION

A challenge that arises consistently throughout the U.S. Department of Energy (DOE) arena is the difficulty in identifying the regulatory requirements ("operating envelope") for the unique operations of a given facility in a cost-effective, timely, and consistent manner. The Uranium Mill Tailings Remedial Action (UMTRA) Project has an even greater challenge, because activities are located at 24 sites in 10 states and often involve different levels of environmental restoration. For example, all site remediation activities have been completed at Tuba City, Arizona (mill tailings have been contained in a geologically safe repository with protective rock and soil placed on top of the tailings), but groundwater monitoring requirements must be addressed throughout the storage cycle. In addition, each UMTRA site can have numerous unique regulatory requirements that must be addressed. While facing this challenge, it became very clear that the UMTRA Project needed a regulatory requirements evaluation process, allowing site-specific criteria to be readily addressed while using a systematic method to define the operating envelope.

For the purposes of the UMTRA Project, the operating envelope has been defined as those requirements that must be met so facility programs or operations can continue to function in a prescribed manner. The operating envelope has been further defined by establishing performance criteria by which all regulatory documents are judged. The result of this evaluation process is the operating envelope regulatory document baseline. In other words, the operating envelope is all regulatory documents determined to be applicable to UMTRA operations at a given site. With this baseline in place, it became apparent that a method was needed to perform these operating envelope evaluations in a consistent manner while still retaining the same logic and methodology without excessive dependance on support personnel.

WASTREN, Inc., originally delivered a requirements identification document to the UMTRA Project Office in August 1992. While this document met the needs for one UMTRA site, there were limitations to applying this manual system throughout the Project. Because no electronic system was available to address the needs of the UMTRA Project, we decided to design the Preliminary Requirements Identification Document (PRID) data base to control the evaluation process. The PRID data base, as designed by UMTRA Project personnel, will focus evaluation efforts for future activities and allow these evaluations to be conducted in a timely manner.

PRID DATA BASE METHODOLOGY

The PRID data base system includes the following elements:

- Operating Envelope Strategy
  The PRID data base contains the operating envelope criteria that have been selected for the UMTRA Project. The operating envelope criteria have been determined to be
  - The confinement of residual radioactive material (RRM), hazardous materials, hazardous wastes, or measurement of their release to the environment.

- The environmental, radiological, and/or occupational safety and health of personnel in accordance with applicable programs.
- Continued, reliable remedial actions.
- Physical security of UMTRA sites.

These operating envelope criteria establish a consistent baseline that governs subsequent applicability evaluations of all regulatory documents.

- Programmatic Baseline

The PRID data base contains all DOE Orders currently issued and also defines what DOE Headquarters element or outside agency has designated a given DOE Order as needing a higher level of scrutiny (see Table I). For example, in 1991, the Office of Defense Programs defined 93 DOE Orders that needed additional review; in 1993, the Defense Nuclear Facility Safety Board (DNFSB) released a listing of 51 DOE Orders requiring additional scrutiny.

- Document Hierarchy

The PRID data base defines what drives (mandates) the review/evaluation of a given regulatory document. This feature also indicates what drives the review of a given code or standard (see Table I). For example, the review of National Fire Protection Association (NFPA) 101 is driven by numerous regulatory statutes, including DOE Orders 5480.4 and 5480.7, 29 Code of Federal Regulations (CFR) 1910, etc.

- Relevant Codes and Standards

The PRID data base contains all codes and standards (e.g., NFPA, Institute of Electrical and Electronic Engineers [IEEE], American National Standard Institute [ANSI], CFR, and Federal Register [FR]) that are defined within the body of a given DOE Order or other regulatory document. This allows the UMTRA Project to demonstrate a systematic method by which all required codes and standards are evaluated.

- Document Applicability

The PRID data base generates site-specific applicability justifications as the documents are being reviewed. For example, if an UMTRA site does not have a pressurized water sprinkler protection system, the PRID data base will generate a site-specific nonapplicable justification to that effect for NFPA 13.

NOTE:This same logic is used to generate site-specific justifications when a given document does not affect the operating envelope, contains administrative requirements only, etc. This applicability justification element also contains a brief description of each document including scope, function, etc. This brief description also aides subsequent evaluations by providing consistent reference data (see Figs. 1 and 2).

- Graded Approach

The PRID data base provides a recommended graded approach for reviewing each document contained in the PRID data base. This graded approach identifies the level of review recommended for each applicable regulation, based upon the type of document (guidance, standards, etc.), what DOE or outside agency indicated that the document should have a higher level of scrutiny, etc. This graded approach allows the UMTRA Project to focus subsequent reviews of compliance with applicable documents and prioritize the compliance review process.

40 CFR 190 Environmental Radiation Protection Standards for Nuclear Power Operations

This Part establishes the provisions of radiation doses received by members of the public in the general environment and to radioactive materials introduced into the general environment as the result of operations that are part of a nuclear or uranium fuel cycle.

NONAPPLICABLE JUSTIFICATION: The UMTRA Grand Junction Project process does not encompass activities that are part of a nuclear or uranium fuel cycle; therefore, this Part does not impact the UMTRA Grand Junction Project operating envelope.

Fig. 1. Nonapplicable justification statement example.

DOE Order 1322.3C Directory of Departmental Forms

This Order transmits the listing of U.S. Department of Energy forms, which includes all approved departmental forms except energy information forms that are the responsibility of the Energy Information Administration (EI-73).

ADMINISTRATIVE JUSTIFICATION: Although applicable for use of DOE forms at the UMTRA, Grand Junction Project, this Order does not meet the operating envelope criteria as specified in Section 4.0 of this PRID report.

Fig. 2. Administratively applicable justification statement example.

Regulatory Document Matrixes

The PRID data base generates tabular presentations in matrix form for all regulatory documents evaluated. These matrixes include regulatory document information such as identification number, title, and issue date; which (if any) DOE or outside agency indicated that the regulatory document needed a higher level of scrutiny; applicability determination; governing document; and graded approach designation. These hard-copy matrixes allow ready review of each regulatory grouping (see Table I).

- Data Base Features

The PRID data base contains numerous features that enhance performance, such as keyword search capability to readily find a DOE Order, code, standard, etc.; grouping by regulatory document type to expedite reviews; justification statements regarding document applicability; portrait matrixes for each type of regulatory document reviewed; total applicable document counts by regulatory document grouping and total review scope; and an on-line PRID Users Manual. The PRID data base can be copied onto two 3.5-inch diskettes, which allows each UMTRA site to maintain their own version.

- Facility-Specific Equipment

The PRID data base contains boilerplate equipment or component descriptions that allow facility-specific equipment to be identified. These boilerplate descriptions also contain the applicable governing codes and standards for the equipment or process being described. This feature allows each UMTRA site to be effectively described and unique functions to be readily defined (see Fig. 3).

PRID DATA BASE OPERATION

The UMTRA PRID data base is extremely easy to use and maintain. To prepare a new UMTRA site-specific PRID report, the process is as follows:

TABLE I
Regulatory Document Matrix Example

Preliminary Requirements Identification Document (PRID)						
Department of Energy Orders						
Document Number	Document Title	Issue Date	1	2	G/A	Source of Requirement
DOE 5480.1B	Environment, Safety, Health (ES&H) Program for Department of Energy Operations	09/23/86	✓	✓	A	DOE 5400.1
DOE 5480.3	Safety Requirements for the Packaging and Transportation of Hazardous Materials, Hazardous Substances, and Hazardous Wastes	07/09/85	✓	✓	A	DOE 5480.5
DOE 5480.4, Change 4	Environment Protection Safety and Health Protection Standards	01/07/93	✓	✓	A	DOE 5400.5
DOE 5480.5	Safety of Nuclear Facilities	09/23/86	✓	✓	A	DOE 5480.6
DOE 5480.6	Safety of Department of Energy-Owned Nuclear Reactors	09/23/86	✓	✓	N	
DOE 5480.7A	Fire Protection	02/17/93	✓	✓	A	DOE 6430.1A
DOE 5480.8A, Change 1	Contractor Occupational Medical Program	10/19/92	✓	✓	A	DOE 6430.1A
DOE 5480.9	Construction Safety and Health Program	11/18/87	✓	✓	A	Self Mandated
DOE 5480.10	Contractor Industrial Hygiene Program	06/25/85	✓	✓	A	Self Mandated
DOE 5480.11, Change 3	Radiation Protection for Occupational Workers	06/17/92	✓	✓	A	DOE 6430.1A
DOE 5480.13A	Aviation Safety	02/23/93		✓	N	
DOE 5480.15	Department of Energy Laboratory Accreditation Program for Personnel Dosimetry	12/14/87	✓	✓	A	Self Mandated
DOE 5480.16, Change 2	Firearms Safety	10/10/90		✓	N	
DOE 5480.17	Site Safety Representatives	10/05/88	✓	✓	A	Self Mandated
DOE 5480.18A	Accreditation of Performance Based Training for Category A Reactors and Nuclear Facilities	07/19/91	✓	✓	A	Self Mandated
DOE 5480.19, Change 1	Conduct of Operations Requirements for Department of Energy Facilities	05/18/92	✓	✓	A	Self Mandated
DOE 5480.20, Change 1	Personnel Selection, Qualification, Training, and Staffing Requirements at Department of Energy Reactor and Non-Reactor Nuclear Facilities	06/19/91	✓		A	Self Mandated
DOE 5480.21	Unreviewed Safety Questions	12/24/91	✓		N	
DOE 5480.22, Change 1	Technical Safety Requirements	09/15/92	✓		N	
DOE 5480.23	Nuclear Safety Analysis Reports	04/30/92	✓		N	
Total Documents = 20					Applicable to Operating Envelope = 14	

1(✓) = Indicates an Order that needs a higher level of scrutiny, per DNFSB as of July 1993.
2(✓) = Indicates the Order appears on the July 8, 1991, DNFSB 90-2 Recommendation Memo from DP.
G/A = Graded Approach Designation: A - Applicable, B - Applicable, G - Guidance, R - Reference, N - Not Applicable, X - Administrative.
NOTE: Source of requirement is provided for applicable documents only.

Grand Junction Process site

Fire Protection Systems

Portable Fire Extinguishers

Portable fire extinguishers are used as a first line of defense to respond to fires of limited size at the maintenance building. Hand-held units (20 lb or less) are distributed through the maintenance structure, which is located adjacent to the southwest corner of the management complex.

All other structures (management, access control, etc.) at the process site and all project vehicles are also provided with portable fire extinguishers.

Components

2-lb fire extinguishers, numerous

5-lb fire extinguishers, total of four (4)

10-lb fire extinguishers, total of eight (8)

Governing Code(s)

National Fire Protection Association (NFPA) 10

Fig. 3. Facility equipment description example.

- Print hard-copy matrixes for Executive Orders, DOE Orders, Notices, Standards, and the Federal Register series from the PRID master data base. This allows the "upper tier" regulatory documents to be reviewed first, which, in turn, generates nonapplicable decisions for referenced codes and standards, DOE Orders, etc. These matrixes are reviewed for applicability determinations by subject matter experts (SMEs) at the site and at the UMTRA Project Albuquerque office. Because previous evaluations are contained in the PRID master data base, the SMEs can readily review existing justification determinations when required. New regulatory documents can also be added to the master PRID data base as required during the evaluation process.
- Enter the applicability determinations (as discussed above) into the site-specific PRID data base. Upon completion of this process, print the codes and standards matrixes. Using the SME staff discussed above, determine applicability of the codes and standards documents.

NOTE: Because the PRID data base monitors the applicability determinations made for the governing regulatory document, (e.g., DOE Order 5480.7), the PRID data base will automatically generate a site-specific nonapplicable justification statement for the referenced code and standard and update the affected matrixes accordingly. Conversely, since most codes and standards are governed by numerous

regulatory documents, the PRID data base also monitors this status and only allows applicable governing documents to be indicated in the source of requirement column of each matrix.

- Add state codes' or statutes' applicability determinations as required. This feature allows only the regulations for the appropriate state to be contained in the site-specific PRID data base.
- Add permits, agreements, etc., as required. Once again, the site-specific data base will contain only those permits, etc., that pertain to the site being evaluated.
- Prepare the facility equipment description portion of the site-specific PRID data base. The generic facility equipment description portion of the master PRID data base contains in excess of 120 equipment or process descriptions along with the governing codes and standards. Each applicable equipment description, including brand name, quantity, method of operation, location on site, and actual governing code used, is then defined for the actual site condition/operation.

  NOTE: Because the facility equipment description portion of the PRID data base is used to complement the mandatory evaluation requirements of the balance of the system, only those facility equipment descriptions applicable to the site being evaluated are discussed. In other words, if only 30 facility equipment descriptions are applicable to the site being evaluated, then only those 30 descriptions will appear in the final PRID report. It is not necessary to generate nonapplicable statements for facility equipment descriptions that do not apply to the site being evaluated.
- Prepare the introductory portions of the site-specific PRID data base. This includes the site introduction and historical perspective, operating envelope methodology, operating envelope criteria selected for the site, graded approach methodology (this assists in the Project's subsequent assessments of documents determined to be applicable), scope of evaluation, etc.
- Print the final site-specific PRID data base report. With the PRID data base controlling the total process, the final report is automatically generated with appropriate headers and footers, document counts (for both total evaluation and by individual regulatory document type), table of contents, pagination, and appendixes.

The PRID master and site-specific data bases can be updated as new regulatory documents need to be added. This feature ensures that subsequent evaluations use the latest data available in addition to being consistent for all PRID-type documents generated. Because the PRID master data base *can be focused PRIOR* to beginning an evaluation, the process can be as large or as small as required.

CONCLUSIONS

Use of the PRID data base has resulted in a number of advantages and enhancements for the UMTRA Project, including

- Public Response
  The PRID data base produces a very comprehensive paginated document, which has been successfully used in support of initiating new site activities. Questions presented by the public, such as "what all did UMTRA look at," "how will this work be accomplished," etc., can be readily addressed.
- Response from DOE Oversight Groups
  The PRID data base is used by the UMTRA Project to prepare for oversight audits and reviews. It allows questions from these oversight groups, regarding document applicability, to be addressed in a timely fashion. The PRID data base methodology has been very well received by these groups.
- Adaptability
  The scope of the PRID data base can be expanded or reduced, depending upon the type of review being conducted. For example, there would be considerably fewer potential applicable regulations for ground water monitoring activities versus surface remediation activities. In addition, new or unique regulatory documents can be added as needed.
- Speed
  The PRID data base generates numerous reports, including applicability justifications, document counts, document groupings, etc. In addition to reduced manpower requirements for these efforts, production time is greatly reduced.
- Quality
  The PRID data base generates the majority of elements for the final site-specific PRID reports and also monitors nonapplicable justifications required, document totals, etc. This feature reduces the possibility for errors and enhances the overall quality of the reports generated.
- Consistency
  The PRID data base ensures effective reviews by use of a consistent methodology.

In closing, the PRID data base, designed by UMTRA Project Office personnel, has greatly improved the efficiency of our document evaluation activities. The methodology not only meets or exceeds current DOE requirements, but provides a vehicle that can be tailored to meet future needs and specific reviews by oversight groups. While this PRID data base does not determine level of compliance with applicable requirements, it does provide a systematic method to determine which regulatory documents are applicable and define why other regulatory documents are not applicable. It is an approach that is unique throughout DOE.

REFERENCES

1. WASTREN, Inc., Requirements Identification Document and Systems Identification Report for the Uranium Mill Tailings Remedial Action Project at Grand Junction, Colorado (August 5, 1992).

2. VICTOR STELLO, JR., U.S. Department of Energy (DOE), Order Compliance Memorandum (July 8, 1991).

3. U.S. Department of Energy Implementation Plan. Prepared in response to Recommendation 90-2 of the Defense Nuclear Facilities Safety Board, Revision 4 (July 1993).