

ENGINEERING PRACTICES WORKING GROUP ANNUAL REPORT TO THE DIRECTORS January – September, 2005

1. Introduction

Executive Summary: Formed in mid-2003, the Engineering Practices Working Group (EPWOG) completed its second full year of existence. EPWOG gained interest and energy quickly, and had a positive impact during its first year. The second year has shown recognition of that impact, growth and maturing of its subgroups, and growth of the working group through new member interest. During this period, the Defense Nuclear Facilities Safety Board (DNFSB) cited the EFCOG paper (authored by EPWOG) on Design Adequacy of Safety Systems as a model for evaluating confinement ventilation systems in their DNFSB Recommendation 2004-2. During this period, the Value Management subgroup was chartered and began activities, facilitating two substantive efforts for EPWOG itself. The Configuration Management subgroup matured and became productive, and the Engineering Standards subgroup found new direction. Seven new (to EPWOG) member companies began participating in EPWOG or its subgroups, and membership increased 40%.

Engineering Practices is an active group, and has over 140 members, participating in the working group itself or one of its four subgroups: Fire Protection; Engineering Standards; Configuration Management; and Value Management (Value Engineering).

Purpose: The purpose of the Engineering Practices Working Group is to promote engineering excellence in the execution of Department of Energy (DOE) missions by sharing best industrial practices, applying lessons learned and providing integrated recommendations to Department of Energy officials.

Objectives: EPWOG facilitates the objectives of the Energy Facility Contractors Group (EFCOG) as it relates to Engineering Practices. EPWOG serves as a the initiator and sponsor of various sub-groups and task groups that are formed from time to time for the purpose of addressing specialized subjects.

Scope: The Group's scope includes the areas of engineering practice that are associated with DOE facilities, programs, and capital acquisitions. This includes the application of engineering practices throughout the lifecycle of DOE facilities, including initial design and construction, commissioning, operation and maintenance, decommissioning, and closure. Engineering practice is the application of engineering disciplines and processes as governed by national codes and standards, recognized quality standards, and DOE orders and regulations.

2. Membership

There are total of 143 members in EPWOG, including 34 members of the working group, and an additional 109 members in the four subgroups. Some EPWOG members also participate in one or more of the subgroups, and the reported numbers only count those members once. Seven separate DOE sponsors support the working group and subgroups. There are DOE sponsors from DOE-OECM, DOE-EM, DOE-EH, and NNSA.

Represented member companies include:

AREVA (Framatome ANP)
Argonne National Laboratory
Battelle Energy Alliance
Bechtel Jacobs
Bechtel National Inc.
Bechtel Nevada
Bechtel SAIC Company
Booz Allen Hamilton
Brookhaven National Laboratory
BWXT Y-12
BWXT Pantex
CDM Federal Programs Corporation
CH2M HILL Hanford Group
EXCEL Services Corporation
Fermi National Accelerator Laboratory
Flour Fernald
Flour Government Group
Flour Hanford
Jacobs Engineering
KSL Services (KBR, Shaw, LATA)
Honeywell FM&T
Hughes Associates
Idaho National Laboratory
Lawrence Berkeley National Laboratory (UC)
Lawrence Livermore National Laboratory (UC)
Los Alamos National Laboratory (UC)
Midwest Research Institute (NREL)
Oak Ridge National Laboratory (UT-Battelle)
Pacific Northwest National Laboratory (Battelle)
Parsons
Pro2Serve
Sandia National Laboratories
Tetra Tech FW
The Shaw Group
Washington Closure Hanford
Washington Group International
Washington Savannah River Company
Washington, TRU Solutions

West Valley Nuclear Services Company

Working Group Leadership

Engineering Practices Working Group

Chair	John Gertsen	BWXT Y-12
Vice-Chair	Dave Lowe	CH2M HILL Hanford Group
Secretary	Tobin Oruch	Los Alamos National Laboratory (UC)

Fire Protection Subgroup:

Chair	Richard Lewis	Washington Savannah River Company
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Configuration Management Subgroup:

Chair	Tom Reed	BWXT Y-12
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Engineering Standards Subgroup:

Chair	Stan Palmer	Idaho National Laboratory (BEA)
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Value Management Subgroup:

Chair	Richard Harrington	Washington Closure Hanford
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3. Objectives and Achievements

EPWOG accomplishes most of its work through task teams that are formed to address specific focus areas that are periodically selected by the membership. Task teams are formed and led by volunteers from the membership. They meet separately and report back to the membership at quarterly meetings. EPWOG meets 4 times per year, twice via nationwide teleconference, and twice in-person. At the meetings, task teams report on progress, new focus areas are discussed, and new task teams are formed.

Accomplishments in the EPWOG focus areas were:

- Safety System Design Adequacy – There has been continuing follow-up interest and activity in this area during 2005. EPWOG published a report, “Safety System Design Adequacy” in 2004. The report, lauded verbally by DNFSB staff, ended up being cited in DNFSB Recommendation 2004-2, *Confinement Ventilation Systems*, as a model for performing evaluations of and making upgrade decisions for existing safety systems. Activity in 2005 has involved addressing additional feedback and comments from the safety analysis community (both EFCOG and federal), and working on implementation activities at several sites. Ken Keith, EPWOG member from BWXT Y-12, has served as a subject matter expert to facilitate implementation.
- DNFSB Recommendation 2004-2 Implementation – At the invitation of DOE-EH, EPWOG members (Ken Keith, Dave Lowe, Rich Salizzoni, & John Gertsen) have participated in implementation planning for the subject DNFSB recommendation. Specifically, EPWOG was solicited because of the work on design adequacy of safety systems, discussed above. EPWOG members were some of the only contractors to participate in these planning activities, and provided key contributions to establishing evaluation criteria.
- HEPA Filter Testing – In coordination with the ISM Working Group, EPWOG has had on-going interest and activity in this topic. To date, efforts have focused on near-term

availability of DOE testing capabilities, and some consideration for re-opening discussion on the need for testing. Based on successful move and start-up of the DOE filter test facility, and based on direction for testing from EH, the original initiative has been closed and documented, by Rich Salizzoni, Washington Savannah River. On-going efforts are expected on standards/acceptance criteria, again, in coordination with the ISM Working Group.

- Drawing Management – A significant effort was undertaken and completed this year under the leadership of Cherri DeFigh-Price, CH2M HILL Hanford. Surveys of drawing management practices at member companies were conducted. Then a Value Management study was undertaken, in conjunction with the Configuration Management subgroup meeting, to review the survey data, define and share best practices, and expose members to valuable tools. A final report was published and distributed, and a detailed briefing was provided to EPWOG members. Several best practices are being published as a result of this initiative. Some sites have already moved to adopt the drawing category definitions that were defined by this effort. Furthermore, some sites are implementing modern tools associated with 3-D models and digital imaging.
- Excavation/Penetration Permitting – A survey of practices in this area was conducted by Marv Olson, PNNL. The results were compiled and published, along with references to a related OA report on the same topic. The combined materials constitute the state of the complex, and have been distributed to EPWOG members.
- Human Performance Engineering – Based on interest of members, Rich Salizzoni led an effort to provide available training and other information on Human Performance Improvement techniques, tailored for engineers. A CD with pertinent information was distributed to EPWOG members.
- Value Management – Following up on initiating actions taken in 2004, the Value Management subgroup was formally chartered in 2005. Further activity is reported under the subgroup.

Four EPWOG meetings were held in 2005:

January 19, 2005 Nationwide Teleconference

April 19-20, 2005 General Meeting at Sandia National Laboratory, New Mexico

July 20, 2005 Nationwide Teleconference

October 19-20, 2005 General Meeting at PNNL Offices, Washington, DC

Fire Protection Subgroup - Objectives and Achievements (Richard Lewis)

The Subgroup focused on the following areas during the reporting period:

- Benchmarking of Fire Protection Testing, Inspection and Maintenance
- NFPA Technical Committee Members - How they interact with their respective sites and within the complex as a whole
- Reliability Centered Maintenance (RCM) – What can be done in the complex to implement RCM to reduce costs
- Consistency of Equivalencies and Exemptions between Sites – What can be done to get greater consistency across the complex on the implementation of Equivalencies and Exemptions

To support the efforts of the Subgroup three conference calls and one meeting were held. Conference calls and the annual meeting were conducted on the following dates:

January 26, 2005 – Conference Call. Discussed the drafts of 10 CFR 851 and DOE Order 420.1B. Comments on both documents were requested. Also discussed what initiatives the Fire Protection Subgroup should address in CY05. Fifteen members of the Subgroup participated in the Conference Call.

June 6, 2005 – Annual Meeting held in Las Vegas in conjunction with the NFPA World Safety Conference. Topics included Lightning Protection System maintenance, Reliability Centered Maintenance, Lessons Learned at Rocky Flats, Site Reports and a review of current initiatives. Nineteen members of the Subgroup participated in the meeting.

September 7, 2005 – Conference Call. Discussed DOE Complex NFPA Technical Committee members, the DOE Fire Safety Workshop and NFPA Convention in 2006, requirement to do internal obstruction investigations of wet pipe sprinkler systems, and the implementation of NFPA 1710.. Fourteen group members participated.

December 7, 2005 – Conference Call (planned). This will be the last conference call of the calendar year. Agenda items planned include selection of a new Subgroup chair, status of the 10 CFR 851 Rule to be issued, and identification of initiatives the group will address in CY06.

Deliverables/accomplishments for the year included:

- Developed a list of National Fire Protection Association (NFPA) committee members working at DOE sites and initiated communication with the committee members to encourage greater communication within the DOE Complex.
- Developed consensus comments for 10 CFR 851 (draft).
- Shared information with other DOE sites to assist in implementation of Reliability Centered Maintenance.
- Shared information on Equivalencies that might be of use to other sites.
- Provided rough data on staffing levels for Inspection, Testing and Maintenance organizations across the complex.

Configuration Management Subgroup - Objectives and Achievements (Tom Reed)

The EPWOG Configuration Management (CM) Subgroup was refocused in 2005 to address mainstream CM issues. Since the group had not convened for many years and focus of the group had centered on CAD/CAM issues, the Subgroup Chairman made contact with the key CM managers and practitioners at the DOE & NNSA sites in early 2005. In doing so, new members were asked for input on contemporary CM issues as candidates for developing guidance and documenting methodologies. The CM Subgroup “purpose statement” and roster on the EFCOG CM Website was updated in February 2005. A meeting was organized and held at the Las Vegas, NV, Marriot Convention Center March 7-11 of this year.

The CM Subgroup meeting was jointly held with a Value Management study facilitated by Richard Harrington. The meeting was co-sponsored by CH2M Hill and BWXT Y-12. There

were 25 attendees, representing 13 Contractor sites and 6 NNSA or DOE representatives. Mary Haughey of DOE-HQ provided an overview of the October 2003 revision of DOE-STD-1073. Site descriptions & CM implementation status briefings were provided by each site. Al MacDougall of the NNSA Service Center in Albuquerque attended and exchanged ideas for training being prepared for NNSA Facility Representatives on the System Engineer Program oversight. Jim O'Brien from OA-40 at DOE-HQ attended because of his role in assessing programs across the DOE Complex.

The excellent attendance spoke volumes on the interest in configuration management issues. The meeting also re-established the network of Contractor CM Program Managers across the NNSA/DOE Complex. Likewise, it opened avenues for communication between the Contractors and NNSA/DOE for discussing CM issues and areas of concern. There was certain confirmation that several CM issues are common to the various sites. Communication and exchange of information between the sites continued throughout the year. Interaction among the group members over the last few months validates the need for the CM Subgroup to remain active in sharing lessons learned and working CM issues.

Engineering Standards Subgroup - Objectives and Achievements (Stan Palmer)

This subgroup has not been very active the last year and one half due to transition activities related to the formation of the umbrella working group. Stan Palmer of INL has accepted the responsibility to be the chairman of this subgroup after several years of excellent leadership by Tobin Oruch of LANL. A conference call was held in September to discuss engineering standards and to plan a meeting to initiate new activities. It was agreed to hold a one-day meeting (March 27, 2006) in Las Vegas just prior to the start of the CSI convention. A teleconference to finalize details of this meeting will be held in November.

Currently the various company standards managers are preparing to switch their specifications from the CSI 1995 format to the CSI 2004 format. This will be time consuming as the numbering has changed and the total number of divisions has gone from 16 to 50. The DOE does not require the switch to the new format but all of the industry will be moving over in the next couple of years.

Value Management Subgroup - Objectives and Achievements (Richard Harrington)

The Value Management subgroup was formally chartered this year, following initiation activities begun during 2004. Doug Maynor, NETL, is the Department of Energy (DOE) sponsor.

During this first year, the Value Management subgroup completed a very successful VM study on Configuration Management for Facilities Transitioning to Closure. This study was done in conjunction with the Configuration Management subgroup, garnered significant interest from EPWOG members and from DOE officials alike, and resulted in a formal report that has been published. A series of Best Practices related to this effort was also published.

The first subgroup meeting was held in San Diego in conjunction with the Society of American Value Engineers (SAVE) International Annual Conference. Two bi-monthly conference calls were completed, between key contractors, and DOE-HQ and field offices.

4. Planning for the Next Year

EPWOG has the following initiatives in progress, and planned for 2005:

- Engineering for Non-Nuclear Work & Criteria for Engineering Involvement in Maintenance – These difficult topics continued to generate significant interest from the members. It was decided that the two topics were related, and should be combined. Bob Knudson, KSL Services is leading the refinement of this task and path forward. A Value Management study will be conducted in November, 2005, in conjunction with the fall EPWOG meeting to complete this study.
- Engineering Procedures – For the second time in two years, EPWOG will facilitate a voluntary sharing of Engineering procedures among interested members at the November meeting.
- Power Reliability Standards for Safety Systems – At the suggestion of DNFSB staff and the NNSA Chief, Defense Nuclear Safety, EPWOG will explore the potential of proposing revisions to DOE standards for power for some safety systems, to something less than IEEE Class 1E, if substantive savings can be realized. The purpose of this initiative is to focus limited resources on the most important aspects of safety system performance.
- Integration of Safety and Design – At the request of the EFCOG Board, EPWOG will participate in this initiative that will cut across working groups.
- Additional potential task teams include: protecting security basis requirements throughout design and modification processes; configuration management of skid-mounted (or packaged) equipment delivered to a performance specification; and potential sponsorship of an engineering workshop.

EPWOG Meetings planned for 2005:

January 18, 2006	Nationwide Teleconference
April 18-19, 2006	General Meeting at National Renewable Energy Laboratory
July 19, 2006	Nationwide Teleconference
November 14-15, 2006	General Meeting at Washington, DC (tentative)

Fire Protection Subgroup Planning

The Fire Protection Subgroup intends to begin the year by identifying new initiatives that may be appropriate for the group to address. The greatest benefit of the group has been the increased communication within the fire protection community. To assist in this communication, telephone conference calls will continue to be conducted approximately once per quarter, a meeting of the Subgroup will be held, if possible, in conjunction with the DOE Fire Safety Workshop or other forum and the email distribution list and contact list will be maintained.

Configuration Management Subgroup Planning

Topical areas to be addressed in 2005:

- CM implementation in a Laboratory environment.
- CM application to Security Systems.
- Maturing of the graded approach.
- Follow-up on drawing management issues from the VM study.

Engineering Standards Subgroup Planning

There is quite a bit of interest in design build and the use of performance specifications within the energy contractors' construction community at this time. Standards for performance specifications should be undertaken help those companies that are just starting to use them.

It was suggested, by EPWOG, that the Engineering Standards subgroup take on the challenge to make one code (such as the IBC) the governing document for design work on facilities. The current system requires design to comply with several codes, which often conflict. Stair and handrails are a specific example with differing requirements for tread and riser dimensions and intermediate rail locations. The subgroup will attempt to work on this issue with committee members at their respective sites.

Value Management Subgroup Planning

Value Management will continue to be promoted or demonstrated across the complex. A VM study is planned for November, 2005, in conjunction with the fall EPWOG meeting to address a graded approach to Engineering work for non-nuclear facilities. A presentation is planned at Brookhaven National Laboratory, to develop future VM studies. Additional activities are likely with the Hanford Waste Treatment Vitrification Plant and another EPWOG-related effort on design decisions.

During the coming year, it is planned to develop the VM subgroup webpage to promote the use of VM across the complex.

EPWOG Interactions with Other Working Groups

The Engineering Practices Working Group recognizes a close relationship with activities in the Project Management, Infrastructure Management, and Safety Analysis Working Groups. In the past, EPWOG has invited the chairs of those groups to speak at EPWOG meetings to improve communication and awareness. This practice will be continued in the future, although schedules precluded such invitations during 2005. As previously noted, EPWOG has been coordinating efforts with the ISM Working Group, on issues related to HEPA Filter Testing capabilities and associated standards. Interactions with the ISM Working Group have also occurred due to common interest in the ISMWG sponsored alert on welding programs, and the involvement with QA in design. Expanded relations with the Safety Analysis Working Group occurred this year, primarily due to efforts related to implementing the Safety System Design Adequacy recommendation, and due to DNFSB Recommendation 2004-2. Regular communication is now occurring between EPWOG members and SAWG members.

5. Lessons Learned

There are no specific lessons learned to report from the Working Group.

A positive aspect of the working group and its subgroups this year has been the continuation of increased communication among members, as noted last year. Members of EPWOG are now routinely communicating, using the working group as a sounding forum, on issues that arise in their locations. In the Fire Protection subgroup, communication within the DOE Fire Protection community has substantially increased, resulting to very positive response to the Subgroup and its activities.

A challenging aspect of the working group and its subgroups is the great diversity among the various members in how Engineering, Configuration Management, and Fire Protection activities are organized and executed at their sites. Working Groups need to keep this in mind, to ensure value is maintained for all its members.

In the Fire Protection subgroup specifically, lack of funding to allow Subgroup members to participate in face-to-face meetings has hindered exchange of information and development of better working relationships. Teleconferences and holding meetings in conjunction with other Fire Protection community events/conferences have been used to help mitigate that problem. However, lack of site specific resources for travel have hindered some member Fire Protection representatives from participating in face-to-face meetings.

6. Effectiveness Evaluation

EPWOG has been effective, and its influence and participation is expanding. New participants, some of whom were skeptical, have joined in endorsing the existence of the group and its accomplishments. Membership is growing for the same reason. The exchange of information and collective problem solving are viewed as positives by the members. Further evidence of its value comes in the frequent e-mail exchanges on specific issues throughout the year. Members treat the group as an additional information and problem solving resource.

Specific evidence of effectiveness this year includes follow-up activities to the 2004 report on Safety System Design Adequacy, which has been lauded by DNFSB Staff, and is now being implemented at several member sites. The report provides a recommended method to make documented evaluations and decisions on how and where to expend additional resources. This is important because it is an area in which the amount of resources that could be expended is extremely large. That fact was recognized by the DNFSB, and was even cited as a model for such evaluations in their recent DNFSB Recommendation 2004-2. Additional evidence of effectiveness is shown by DOE HQ soliciting EFCOG participation in the implementation planning activities for this recommendation as well. Those activities lacked significant contractor participation, other than via EFCOG.

Other evidence of effectiveness is shown in the large federal interest in the rejuvenated Configuration Management subgroup activities. The subgroup's activities are centered on topics of current importance for members, which also align with federal sponsor concerns. The newly formed Value Management subgroup is also gaining federal attention, as it complements renewed DOE interest in this topic, particularly related to projects. The subgroup has also shown how those tools can be applied to non-project applications, via the study completed this year on drawing management.

The Fire Protection Subgroup has attempted to identify opportunities for cost savings by sharing information on Reliability Centered Maintenance, providing comments to DOE-HQ on proposed revisions to DOE Orders that may increase costs and by increasing communication between DOE Sites to share lessons learned.

7. Recommendations

It is recommended that the Engineering Practices Working Group and its four Subgroups continue their activities in support of DOE and the common interest of the contractor community in accordance with the 2006 plans. The Engineering Practices Working Group is available to help support other critical initiatives of the EFCOG Executive Directors and DOE that may be identified during 2005.