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Address to

DOE Facilities Representative Workshop

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Good Morning:

Thank you for the opportunity to participate in this, the 17th Annual Facility Representative Workshop. It is quite an honor for me, since this is the third year I've been invited to speak. I would like to extend my compliments to James Heffner, Steve Lawrence and their teams for coordinating the workshop and re-arranging the schedule to accommodate my schedule.

Let me also extend my congratulations to the nominees for the 2009 Facility Representative of the Year award. I understand that the recipient of this award was announced yesterday morning. Nomination for the Facility Representative of the Year is a tremendous honor and although there may only be one award, in my opinion all the candidates are winners. You are the front line for safety in the DOE complex, and I thank you for your service.

This annual workshop is an important forum for you and your colleagues to exchange experiences and lessons learned. I'm confident that this workshop will help you expand lines of communication with your colleagues in the DOE complex.

What I'd like to do is divide my talk this morning into three parts. First I'd like to briefly
- discuss a high consequence event that most of you are familiar with,
- then make some observations as they may relate to Facility Representatives,
- and finally ask for your help on a safety issue.

Last year while I was preparing my remarks for the 2009 FacRep Conference, I read a report about the fortieth anniversary of the 1969 Rocky Flats fire. For me it was fascinating. In September, 1969, the Navy had sent me to college about 12 miles from Rocky Flats, in Boulder, Colorado. I spent nearly four years at the University of Colorado and, -- frankly – do not recall ever hearing about either the 1969 fire or the nuclear weapons plant. The Mother's Day Fire of 1969 at the Rocky Flats Plant is the high consequence event I would like to discuss briefly today.

How many of you worked at Rocky Flats? It seems like most of the senior folks that the Board meets with have some connection; even our newest Board Member – Jessie Roberson - served as the DOE Rocky Flats Site Office Manager during the clean-up years. I've spent part of this past year reading about Rocky Flats. I visited the Denver area, met with Bruce Campbell who had been a fire engineer at Rocky. He gave me access to records, and provided much of the material in my presentation today. Bruce is now Vice President for DOE Services at Hughes Associates, Lafayette, Colorado. I even met with some of the former workers that were veterans

of the fire, including the facility manager – Jack Weaver, and the union President – Jerry Harden. If there is one lesson I would pass to you, it is that there is much to be learned from Rocky Flats.

Let me give you a little background. I hope to stimulate your interest because there is too little time today to do much more than that.

The Rocky Flats Plant had a preeminent role in the nuclear weapons complex from 1952 until it ceased operations in 1990. It performed two functions. First – with Plutonium received from the Hanford Reservation and Savannah River Plant, the Rocky Flats Plant produced the Plutonium "pits" (also called triggers) in two stage thermo-nuclear weapons. Second, Rocky recovered Plutonium from retired weapons and manufacturing residues to be reused. At Rocky Flats, weapons parts were machined from plutonium, uranium, beryllium, stainless steel, and various other materials. It was almost exclusively a manufacturing facility, and was not a design facility or one where exotic experiments were conducted.

It was a first of kind facility in the United States. From the beginning they confronted hazards while they learned how to mitigate them. In that respect I would characterize the people that worked at Rocky Flats as pioneers. They were confronted with toxic metals, some of which were pyrophoric, much of which was radioactive and required special handling to avoid criticality. The chemicals used in the manufacturing processes had health hazards that became understood only near the end of the plant's life. Twenty-five of these materials were listed as "materials of concern" in the State of Colorado health study released after the facility was closed.

From 1955 until March 1971 there were 602 reported fires. 374 of those were in Plutonium processing areas and 228 were elsewhere within the site boundaries. That's almost one fire a week. 602 are just the reported fires. In 1957 a major fire occurred at Rocky Flats. It started with the spontaneous combustion of a Plutonium "skull" and worked its way into the ventilation exhaust plenum. After the fire, 18.3 pounds of Plutonium was unaccounted for, and eighty-eight nose and throat swabs were positive for Plutonium. Some estimates suggest that more radioactive contaminants were released to the surrounding environment – as much as 1.1 pounds - than the later – and more infamous – Mother's Day fire twelve years later.

But the safety hazard was not just from fire. When I spoke with the retired facility manager – he told me he spent many hours physically inside gloveboxes cleaning and wiping down the residues. One member of our staff while visiting Rocky in 1990 or 1991 was investigating the records of an individual that had exceeded the body burden limit for Plutonium internal exposure. Our staff member was shocked when he was told – 'don't worry about that worker, he will die from chronic Beryllium disease long before he gets sick from Plutonium.'

Underlying these myriad hazards was radiation. Hazardous work was done in gloveboxes to protect the workers from toxic hazards. By 1968 the focus shifted to the radiation hazard. A major effort was made to backfit all the gloveboxes with radiation shielding made of Benelex, manufactured by Masonite. Benelex burns like a hardwood releasing 8240 BTUs/lb, and it was mounted over the glovebox plexiglas. Plexiglas, when it catches fire releases nearly 10,000 BTUs/pound. The ignition temperature for both Benelex and Plexiglas is about 450 deg

C, but Plexiglas will not sustain ignition without a heat source. In 1968 a 3.5 million dollar shielding effort added 1,170,000 lbs of Benelex and Plexiglas to the facility.

That's some of the background. The story about the Rocky Flats Mother's Day Fire is about Plutonium and the fact that it is pyrophoric. Plutonium does not "burn". It simply reacts with oxygen to produce heat and Plutonium di-oxide. Once started - the reaction is somewhat docile – yet persistent. It oxidizes between 600 and 825 deg C. It gives off no flames or gasses; but unless it is agitated, it converts to a sub-oxide that is still pyrophoric. It oxidizes at the rate of 700 gm/hour and gives off 5.2 BTU/gm.

Plutonium was stored in the gloveboxes in plutonium briquettes about one inch thick and three inches in diameter. 3,400 kg of Plutonium was in buildings 776 and 777 on Mother's Day, 1969. It was Sunday and the workforce had the day off. At about 2:15 in the afternoon, engineers and security had conducted a walkthrough of the facility.

What I'd like to do now is take you back to 1969. You will be listening to six minutes from the audio tape in the emergency Operations Center at Rocky Flats, Colorado. Some of the audio is garbled. If you have trouble hearing, an abbreviated transcript will be in blue on the right side of the slides shown on the screen. So for the next six minutes it is Mother's Day, 1969 at the Rocky Flats Plant.

[6 minute RFP Mother's Day Fire slide show]

These are six lessons that fire protection engineers distilled from that fire; but the lessons aren't just for fire engineers. As federal oversight personnel you have a role here. Sprinklers; are they obstructed, have they been tested within periodicity? Combustible loading; keep your eye on it - recently tons of unnecessary combustibles were removed from Y-12 and at the Plutonium facility at Los Alamos. Detection systems; they must work when you need them.

The lesson I would like you to take away is that we don't have to repeat any of these lessons. The lessons from the past are readily available – if we will take the time to search them out. There are books available from Amazon.com. There is even a website about Rocky Flats maintained by the school of Journalism at the University of Colorado. There are still many people in the DOE complex that can relate how we came to impose disciplined operations, configuration management, and Integrated Safety Management. If we learn from the past we won't have to repeat its lessons.

I have only briefly touched upon one incident. Another fascinating story started on a warm summer morning in June, 1989, when a dozen FBI agents and EPA investigators raided Rocky Flats and effectively closed the plant. Another is the successful D&D project. I'm told that the book "Making the Impossible Possible" is used at Harvard as a case study for successful environmental clean-up. Our nation's nuclear enterprise is a series of wildly successful - and unsuccessful – endeavors. We must learn the difference.

Let me share with you something said by the Board's first Chairman, John Conway, when he spoke to the FacRep Conference in 2004. He said:

The Facility Representatives should continue to be demanding customers, assertive owners and responsible custodians. Your attitude and behavior in the facilities and the workplace should take on the following attributes.

- Maintain a healthy skepticism on the job for safety-related matters.
- Strive for excellence in conducting your work.
- Trust your intuition! When you are "uncomfortable" with a situation and your gut and experience tells you something is not right, then "pull the string" until you obtain a satisfactory answer.
- Be thorough and run every issue to ground.
- Keep open and direct lines of communications with your supervisor. Be comfortable going to your supervisor with a problem, and speak out when collateral or other duties are affecting performance of your primary duty.
- Seek continuous improvement and growth in your personal technical competence. It is vitally important to the success of DOE and the Nation.

Not being quite as eloquent as Chairman Conway, I have summarized the qualities of an effective FacRep in three words. They are Competence, Vigilance and Intolerance - Intolerance for deviations from standards and procedures. These are the three characteristics needed in an individual upon whom we rely to avoid high consequence - low probability disasters like the 1969 Mother's Day fire at Rocky Flats, Colorado.

Since the Board's inception, it has been a strong advocate for DOE's Facility Representative Program. Early in the Board's life, Board Recommendation 92-2 was about the need for an effective Facility Representative Program. To quote Chairman Conway again, "The Facility Representative Program ... is a shining example of what can be achieved in the area of technical competence. As with any program, however, if you are not moving ahead and improving, you're falling behind."

As I look across the complex today at the DOE Facility Representatives I see these qualities: Competence, Vigilance, and Intolerance ... for deviations from standards and procedures. The next part of my talk today comes from last year's Occurrence Reports – ORPS as we like to say. Before getting too far let me say clearly that, by themselves, ORPS reports are not a particularly good measure of the health of a facility's safety program. Recognizing that fact ... we did a survey of the 2010 ORPS reports - limited to just those facilities within the jurisdiction of the Defense Nuclear Facilities Safety Board - and found that of those 800 reports last year -- seven were attributed to Facility Representatives. Again, let me emphasize that I'm not attributing any particular significance to the presence – or absence – of ORPS reports. But since there were only seven, I thought it would be interesting to recognize those individuals that initiated those seven reports.

1. Hanford Tank Farms ORPS number 2009-0005, On March 25, 2009, while taking a feed and slurry sample in the 242-A Evaporator Facility, the Office of River Protection **Facility Representative Brandon Williamson** observed the operation of a valve in Section 5.3 of the

procedure that should have been performed in Section 5.1. The Facility Representative notified the Contractor's Senior Supervisory Watch and work was stopped.

2. Los Alamos Waste Management ORPS number 2009-0017. In the morning, August 26, 2009, the Los Alamos Site Office **Facility Representative Dave George** noted that a pallet of transuranic (TRU) waste drums located on the third tier of the storage array at Tech Area 54, Dome 153 were not banded. The Technical Safety Requirements for TA-54, Area G state that, "Stacked TRU WASTE drums are placed on pallets, four drums to a pallet, with drums banded together, two bands per set of four drums." The Facility Operations Director determined that the lack of banding was an administrative TSR noncompliance.

3. Y12 ORPS number 2009-0008. *Remember this date* – On March 4th, while observing the annual change out of Criticality Accident Alarm System detectors, the Y-12 **Facility Representative Scotty Afong** noticed that the calibration stickers had an expired calibration date. Although the Technical Safety Requirement had been changed to extend the calibration requirement from twelve to thirteen months with no grace period, incorrect dates had been written on the stickers requiring calibration at 12 months. The Shift Managers knew the stickers were not correct and had been told by Equipment, Testing and Inspection personnel that the stickers would be corrected. But the stickers had not been corrected. The expired date indicated the detectors should have been inoperable at midnight, March 3rd and the appropriate limiting conditions for operation (LCO) should have been entered. As a result, a TSR violation was filed for the period of operations during which CAAS detectors with expired calibrations were in use.

4. Los Alamos National Lab ORPS numbers 2009-0003, 0004, 0009, 0011: **Facility Rep John Krepps**:

- On February 10, 2009, John noted that there was an unvented transuranic (TRU) waste container in the waste storage area of the basement of Building PF-4. The critique found only sparse documentation concerning this legacy waste item, which indicated that the container held a tritium-contaminated molecular sieve. Management subsequently declared this to be a Management Concern, Significance Category 3.

- On March 16, 2009, John identified deficiencies with a temporary oxygen (O2) monitor installed on a glovebox in Building PF-4. A Technical Safety Requirement (TSR) Specific Administrative Control (SAC) requires the monitor to be alarmed and calibrated quarterly to verify that the local alarm occurs when the O2 concentration exceeds 5%. This temporary (backup) O2 monitor had been calibrated prior to its installation on February 19, 2009 but did not have a visual or audible alarm. Management declared the condition to be ORPS reportable Significance Category 2.

- On June 16, 2009, John was walking the basement of Building PF-4 at Technical Area 55 when he noticed three non-standard unvented drums in a waste storage/assay standards storage area. He was concerned with the possibility of hydrogen build-up in unvented containers and raised this concern with TA-55 management. After review of the detailed

description of the contents of the three drums, management declared the condition to be a Potentially Inadequate Safety Analysis.

- On September 16, 2009, during a weekly facility tour of Technical Area 55, Building 4, John noticed two containers without vents. When he asked, the contractor confirmed that waste was Transuranic. The TSRs require that TRU waste be stored in vented containers, and that liquid waste is stored in an area with a safety shower. One container was an 85 gallon overpack that had been received in 2002, and was stored with the lid bolt ring not tightened. Inside the overpack was a vented 55 gallon drum that contained hazardous liquid waste. In April 2003 it had been determined that the fumes from this drum exceeded the capacity of the filters in air purifying respirators, and having no identified path forward the container remained in storage. In 2009 after results of an assay indicated it contained TRU waste, the container bar-code was changed accordingly. But because it contained liquid waste it was left in the only waste storage area having a safety shower. And, because there was no procedure for installing filter vents in unvented TRU drums the contractor employees had simply forgotten about the container.

Some of you may know that this past year the Board has been paying a lot of extra attention to the activities at PF-4 in Los Alamos. So John Krepps, I personally appreciate the intense oversight that you have been providing – illustrated by these ORPS reports that I just read. And I would like to recognize your efforts with an unofficial award. Could you come up front please. I call it the "spark Plug" Award, and I am presenting it to John Krepps because he exemplifies those three qualities that characterize RacRep professionalism: Competence, Viglilance and Intolerance for deviation from standards and procedures.

Now before I go on, I also want to take a moment to recognize the exceptional performance of the all the Facility Representatives that were nominated by their Site Offices for the FacRep of the Year Award: **Michelle Durham**, Y12, **Patrick Sullivan**, Brookhaven Site Office, **Roy E. McCarthy**, Idaho Operations Office, **John Krepps**, Los Alamos Site Office, **Robert R. Robb**, Livermore Site Office, **Brian Clifton**, Criticality Experiments Facility Nevada Site Office, **Doug Paul**, Oak Ridge National Lab Site Office, **Paul R. Hirschman**, Office of River Protection (ORP), **Laurence P. (Larry) Maghrak**, PPPO, **Brian Jones**, Pantex Site Office, **Clark Gunion**, Hanford, **Teresa Tomac**, Savannah River Site Office, **Edwin Deshong**, SRS Tritium Facilities, and **Heather R. Trumble**, Sandia National Lab.

Now I have intentionally spent a lot of time this morning mentioning the men and women that do the Safety System Oversight as DOE FacReps. That's because FacReps are the eyes and ears that keep DOE nuclear facilities safe through their competence, vigilance AND intolerance for substandard performance. It is the strict compliance with DOE standards that insulates the public and the environment from these hazards.

The Board recognizes that DOE's goal for all personnel in the Technical Qualification Program is 80% fully qualified or on schedule for qualification. I'm pleased to report that at the end of 2009 the program exceeded that goal, and 90% of Facility Representatives were qualified or on schedule for qualification. Furthermore, 74 percent of the required Facility Representatives fully qualified, as compared to last year when only 67 percent of the required

Facility Representatives were fully qualified throughout DOE. During this period, the number of fully qualified Facility Representatives has increased from 141 to 153.

The overall Technical Qualification Program throughout DOE is up two percent and the number of required personnel that are fully qualified is up three percent. The number of fully qualified Senior Technical Safety Managers is up seven percent and Nuclear Safety Specialists is up seven percent since the First Quarter 2009. Those are pretty good statistics – and you deserve the credit for this improvement.

The Board continues to be impressed with the Facility Representative community and the contributions you are making to DOE. You work in unique, hazardous environments, with the challenge to strive for excellence both in your work and in the safety of the facilities you oversee.

The third and final part of my talk today is to ask for your help with a safety issue of interest to the Board. I know that work planning and control does not fall specifically in the FacRep job description. However, as the eyes and ears of the site offices, you can be instrumental in the day to day observations of work performance in the field. Our staff has observed numerous instances where site offices rely almost exclusively on facility representatives to perform oversight of work planning and control along with their myriad other duties. Effective oversight of work planning requires more than field observations. With so many other responsibilities what can you do to efficiently perform effective work planning oversight?

First you need to understand your management's expectations for measuring the effectiveness of work planning and control. Ask yourself how is Integrated Safety Management (ISM) implemented in activity-level work planning and control? Review the site office's approved set of criteria review and approach documents, or CRADs, for evaluating work planning and control, and recommend changes if appropriate. Familiarize yourself with these CRADs and use them to guide your observations in your facility.

I highly recommend you find a copy of the NNSA issued document, *Activity Level Work Planning and Control Processes: Attributes, Best Practices, and Guidance for Effective Incorporation of Integrated Safety Management and Quality Assurance* dated January 2006. This document is referenced in DOE G 440.1-8 *Implementation Guide for use with 10 CFR Part 851, Worker Safety and Health Programs*. It is a useful tool for activity-level work planning, and a terrific resource designed to help you better understand how ISM can effectively be implemented in the work planning process. It also has a well-developed set of CRADs for work planning oversight.

Next, take the time to sit in on the more complex work planning team meetings. Understand how your facility uses the team approach to perform activity-level hazard analysis and develop controls to ensure worker safety. The hazards associated with the work and the necessary controls must be appropriately documented and communicated to the worker. Make sure that workers are intimately involved in the process. Adequate hazard analyses cannot happen unless the work scope has been adequately defined to clearly identify the necessary tasks

to accomplish the work. Many times facility-level hazard analyses are improperly used as the only source to generate controls for hazards to the worker.

In addition to the facility hazard analysis, planning teams should analyze the immediate hazards to the worker including industrial, chemical, radiological, etc. If you have not been to a formal process hazards control course, like the one offered by ASME, you should consider enrolling so that you can provide an honest evaluation of the effectiveness of the work planning team's efforts. You could also benefit from inviting other subject matter experts from your site office like RADCON or Industrial Hygiene to help evaluate the effectiveness of the activity-level hazard analysis process employed in your facility.

When observing the execution of work you can evaluate how well procedures have been written by asking the following questions. Do procedures require numerous revisions? Are "work-arounds" required to execute procedures vice following them as written? Do additional controls or previously unidentified hazards come up in pre-job briefs or during the execution of work? Are procedures burdensome to the worker? When the answer to any one of these questions is yes, then you should question the rigor with which the procedure was written. If you repeatedly see the same procedural deficiencies, then it is likely there is a deeper problem.

Finally, how are work teams collecting feedback? Are post-job briefs the exception or the norm? What is done with feedback from previously conducted work? Is it stored on a shelf somewhere or is it integrated into the work planning process? Is feedback being used to inform the facility-wide work planning process. I have a suggestion on how you can help drive improvement in this critical area. At each pre-job brief you attend ask that the lessons learned from the past performance of this job be reviewed. Make it an expectation that in your facility meaningful lessons learned are discussed before beginning each task.

These suggestions can make an immediate impact on the effectiveness with which your facility implements ISM at the activity-level.

Finally, I would ask one more thing. Keep us informed of your issues and concerns. We all have the same definition of success. Success is the adequate protection of the public – including the workers – health and safety.

That concludes my remarks. Keep up the great work. Thank you.