

Staff Testimony – Aging Infrastructure/UPF

Good morning Mr. Chairman and Members of the Board. For the record, my name is Rory Rauch. I am one of the Board's Site Representatives responsible for overseeing nuclear facilities and operations at the Y-12 National Security Complex.

In this opening statement, I will provide a brief overview of the safety risks of Y-12's aging defense nuclear facilities and the processes used by the National Nuclear Security Administration, or NNSA, to assess and mitigate these risks. I will also discuss some of the current factors affecting the timeline for transition from these facilities to the planned replacement facility—the Uranium Processing Facility, or UPF. Finally, I will discuss issues with the integration of safety into the design of the UPF project.

Building 9212 at the Y-12 National Security Complex, which houses several high-hazard enriched uranium processing capabilities, is approximately 70 years old and was not built to modern nuclear safety requirements. The Y-12 contractor first documented the safety risks presented by Building 9212's structural deficiencies in a safety basis

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document submitted to NNSA in 2004. This document—essentially the contractor’s operating license for the facility—indicated that the facility’s structure did not meet Department of Energy, or DOE, requirements for seismic performance. The contractor’s analysis showed that a severe seismic event could result in a large-scale fire, releasing radiological material to the public and Y-12 workers.

Following the contractor’s submittal of this safety basis documentation, the Board issued a letter on April 20, 2005, advocating that NNSA take a balanced approach in addressing the risks presented by these structural deficiencies. This approach involved three components: construction of a replacement facility built to modern nuclear safety requirements, reduction of the inventory of radiological materials in Building 9212, and the implementation of practical facility modifications.

Consistent with the strategy advocated by the Board, NNSA and the Y-12 contractor have completed a series of Facility Risk Reviews, which were conducted in five-year intervals, starting in 2006 for

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Building 9212, and 2007 for the other highest-hazard facilities at Y-12, Buildings 9215 and 9204-2E, also referred to as “Beta-2E”.

During these reviews, multi-disciplinary teams of subject matter experts rigorously evaluated the condition of each facility and identified the projects needed to ensure continued safe and reliable operation. The teams prioritized these projects using weighted scoring criteria that balanced factors such as safety and production benefit, duration of benefit, cost, and ease of implementation. Some of the highest priority projects included the replacement of aging electrical systems, which presented an increased fire risk. The reviews also placed a high priority on replacing degraded ventilation systems, which protect workers from airborne radiological hazards. Overall, the highest priority projects were identified for Building 9212 systems, which were in poorer condition and presented greater safety risks than those in Buildings 9215 or Beta-2E.

The contractor is making significant progress in implementing the practical risk-reduction measures recommended by the Facility Risk

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Review teams. Much of this progress is being made under the auspices of the Nuclear Facility Risk Reduction project. This 75 million dollar line item project began in October 2011, and is scheduled to last approximately four years. The Nuclear Facility Risk Reduction project's scope includes several substantial sub-projects to upgrade electrical, ventilation, and utility systems in Building 9212. In addition, NNSA, via the Y-12 contractor, set aside the funding to make substantial reductions in the inventory of radiological materials in Building 9212. Currently, the facility's enriched uranium solution inventory has been reduced to approximately 25 percent of its 2006 levels.

Despite the contractor's progress to date, two recent changes to the schedule for building UPF have challenged Y-12's aging infrastructure risk management efforts. First, the latest schedule for UPF indicates that the facility will start operations that are currently performed in Building 9212 in late 2025. This is a delay in the transition timeline used by the Facility Risk Review teams for Building 9212, who assumed that enriched uranium operations would transition to UPF by 2021. Second,

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in February 2012, the NNSA Deputy Administrator for Defense Programs issued guidance to the UPF project that deferred the scope of Beta-2E and 9215 enriched uranium operations from the initial operational phase of UPF. NNSA's latest estimate for the completion of transition of these operations to UPF is now 2038, which represents a delay of nearly 17 years from initial planning estimates. By 2038, Buildings 9215 and Beta-2E will be approximately 80 and 65 years old, respectively. Extending the timeline for transition of operations from these facilities to UPF increases the duration for which the Y-12 contractor must manage the safety risks posed by ever-aging systems.

As I've discussed, UPF is NNSA's planned long-term solution to the aging infrastructure problem at Y-12. To be successful, the UPF project team must adequately integrate safety into the design of UPF. I'd like to elaborate on three specific areas relating to the integration of safety into the UPF design.

The first topic concerns safety issues with the Preliminary Safety Design Report, or PSDR. The PSDR is a developmental safety basis

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document intended to capture the preliminary hazard and accident analyses and the safety controls at the end of preliminary design. In an April 2012 letter to NNSA, the Board identified deficiencies with the UPF PSDR that led the Board to conclude that the UPF project team had not adequately integrated safety into the preliminary design. We discussed these deficiencies during the Board's October 2012 public hearing. The UPF project team revised the PSDR and supporting hazard and accident analyses to address these issues, and submitted the revision to NNSA for approval in September 2012. NNSA formally approved the revised PSDR in March 2013. The Board reviewed the revised PSDR and observed that while NNSA made progress in addressing prior safety issues, additional action is still needed to improve the integration of safety into the UPF design. In August 2013, the Board wrote a letter to NNSA and identified that the PSDR had not demonstrated that many credited safety controls are capable of effectively performing their safety functions. Resolution of these new issues could lead to NNSA identifying additional safety controls at UPF.

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The second topic concerns potential safety impacts from NNSA's direction to defer the Buildings 9215 and Beta-2E scope to a later date, currently estimated in the mid- to late-2030s. While I discussed the potential impacts of this direction on the operating facilities, it also introduces unique challenges and potential safety risks for the UPF project. The UPF project has completed a series of engineering studies to evaluate the deferred scope. These studies have started to define the safety considerations that NNSA will factor into the design effort to minimize potential safety impacts on the current project scope.

The third topic concerns the project team's progress in evaluating the potential safety impacts from the redesign effort to resolve equipment spacing and fit issues. The UPF project has identified that increases in ceiling height may impact the performance of the fire suppression system. This possible safety risk will remain until the project team completes its evaluation of the fire suppression system design accounting for the spacing and fit solution.

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Another critical aspect of the UPF project is NNSA's ability to properly oversee the safety aspects of the UPF design's development. Federal staffing has been a long-standing concern, identified in the Board's August 2007 and April 2012 project letters to NNSA. During the past year, the federal project team has increased in size and the team's capability has improved. NNSA also plans to hire approximately 10 additional federal personnel. Notwithstanding these improvements, an independent NNSA review conducted in June 2013 concluded that the federal project team lacked critical subject matter expertise and was not staffed in accordance with its staffing plan. Until the UPF project team is adequately staffed, the Board's staff remains concerned that NNSA will not be able to provide adequate safety oversight of this hazardous and complex nuclear project.

Despite any delays in the transfer of operations from existing facilities to UPF, NNSA must be able to meet important national security needs. Ultimately, NNSA may be forced to further extend the mission life of certain enriched uranium processing capabilities in

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facilities that do not meet modern DOE safety requirements. Moving forward, NNSA must continue to evaluate the conditions and risks of aging nuclear facilities, prioritize risk mitigation activities, and execute upgrades to the maximum extent possible to ensure continued safe nuclear operations at Y-12.

This completes my prepared testimony. I would be happy to answer any questions from the Board.