Section A – Headquarters CRD:
DOE Order 430.1B, Attachment 2

Section B – General Clarifications:

1. CRD O 430.1B Section 5, MAINTENANCE: A Maintenance Strategy shall be in place to provide a logical and consistent process for periodic maintenance. The strategy shall demonstrate a graded approach that supports the most appropriate and cost-effective means to achieve overall maintenance objectives. The maintenance strategy is intended to identify essential equipment that may be overlooked and/or become degraded, and in other cases identify resources that may be wasted on equipment no longer important.

A graded approach will be applied to the development of periodic maintenance activities, based on analysis, in order to best support mission needs. The graded approach for maintenance focuses on the timely and judicious application of maintenance resources in a manner designed to minimize risk while being as efficient as possible. Evaluation techniques are used to determine the most appropriate and cost effective means of ensuring that plant equipment meets compliance, safety, and mission requirements. Depending on facility or equipment mission and status, decisions may be made to discontinue routine maintenance if employee, public, and environmental health and safety are not compromised (e.g., for facilities that have a limited operational future or are vacated and awaiting D&D). The graded approach that is applied will be based on sound engineering judgment. A graded approach is applied based on the following criteria:

- The relative importance to safety
- The magnitude of the integrated hazards involved
- The programmatic mission of the facility or system
- The operational impact to the facility or system and other Hanford contractors
- Possible redundancy of monitoring equipment or built-in safeguards to failure.
- Cost versus Benefit.
- The frequency that the maintenance activity is performed

Equipment that performs nuclear safety, industrial safety, environmental compliance, or mission critical functions should be more fully analyzed than equipment that performs habitability or convenience functions. The analysis results will be the basis for adjusting acceptance criteria and intervals, as well as determining if activity is required. Excessively narrow operating parameters or equipment tolerances will result in higher operation and maintenance costs, and excessively broad criteria may not catch impending failures. If the consequences of failure are minimal or non-impacting to facility operations, safety or the environment, then decisions on whether and how to perform periodic maintenance could be based solely on a cost/benefit analysis. Where the consequences of failure are significant, the potential consequences will be the primary drivers in making periodic maintenance program decisions; however, this does not preclude consideration of economic costs/benefits.

Appropriate maintenance periodicities minimize the likelihood of equipment failure causing unacceptable consequences. Unacceptable consequences could include impacts to employee or public safety and health, environmental damage, mission impacts, operational impacts to other Hanford contractors, financial impacts, or compliance with regulatory requirements. Shorter interval/frequencies may reduce impacts associated with out-of-tolerance conditions. Longer interval/frequencies, where warranted, may reduce overall periodic maintenance cost. An effective periodic maintenance program reduces the overall failure rate of the equipment involved, while minimizing the downtime of the equipment and the possibility of introducing new failures, and generally reduces overall costs and facility operational impacts.

Based on requirements basis analysis, the appropriate periodic maintenance methods, techniques, parameters, to establish a safe, effective, and efficient maintenance program should be determined. Other logical examples of analysis are provided in the current issue of DOE G 433.1-1, Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1B.
Some periodic maintenance methods may be intrusive or operationally impacting; where possible, these may be avoided in favor of less impacting, PdM (Condition Monitoring) methods when such alternate methods offer similar benefit. An example is vibration or thermal analysis of motor bearings as compared to taking shaft run-out measurements. Even when intrusion is required, PdM may offer advantages over preventive maintenance. An example is performing switchgear thermography to determine if and where problems exist versus periodic re-tightening (torquing) of all switchgear electrical connections. Some risk is involved since predictive maintenance relies of some level of degradation as an action trigger.

The recommended approach to meeting requirements, avoiding unacceptable consequences and controlling costs for each system will be identified/described. This includes consideration of how the work is to be performed, by whom, and the periodicity or other controlling factors. A determination needs to be made between a Corrective Maintenance or a Preventive Maintenance (Intrusive) and a Condition-Based Maintenance (Non-Intrusive) approach to maintaining the system. The maintenance strategy for a system, structure, or component (SSC) should use the following parameters:

**Regulatory:** Review the SSC to determine if it is required by law, codes/standards, DOE Orders, or contractual requirements.

**Safety:** Review the SSC activity to determine if its adjustment or non-performance could increase the likelihood or consequences of an event that would negatively impact employee, public, nuclear, or environmental safety.

**Mission:** Review the SSC activity to determine if its adjustment or non-performance could cause a non-recoverable schedule impact, resulting in failure to meet Tri-Party Agreement (TPA) milestones or other contractual commitments.

**Cost/Risk:** Review the SSC activity to determine if its periodic maintenance or non-performance (i.e., due to equipment or system failure and/or planned or unplanned outage of system services) could result in an unacceptable cost/risk impact to the performing contractor or other Hanford Site contractors (i.e., production impacts affecting milestones or contractual commitments, costs associated with work stoppage or inactivity, incremental costs associated with Corrective versus Preventive maintenance, etc.) compared to the recurring cost/risk of activity performance. Preventive Maintenance and Corrective Maintenance cost information along with potential costs associated with system failure are annualized if possible to achieve an “apples to apples” comparison and support maintenance planning decisions.

The maintenance strategy shall be assessed and necessary changes made to coincide with annual contract baseline and budget planning or when project/mission scope changes significantly. Provide RL a summary of the results including current and future mission related impacts to the applied maintenance strategies.

As part of the management decision process, the Contractor will decide to continue a full or graded predictive/preventive maintenance program. Factors that may influence a management decision to continue predictive/preventive maintenance could include the following:

- Recent SSC performance trends
- Replacement part availability
- Vendor recommendations/warranty requirements
- Non-cost related risk avoidance
- Engineering judgment

See the flow chart below for an overview:
**Contractor Requirements Document (Supplemented) Form**

### Section C – Specific Clarifications: None

### Section D – General Supplemental Requirements: None

### Section E - Specific Supplemental Requirements: None