DOCKET NO.: 70-3103
LICENSE NO.: SNM-2010

LICENSEE: Louisiana Energy Services
National Enrichment Facility
Lea County, New Mexico

SUBJECT: SAFETY EVALUATION REPORT OF LOUISIANA ENERGY SERVICES AMENDMENT REQUEST TO CLARIFY LICENSE REQUIREMENTS FOR ADMINISTRATIVE CONTROL ITEMS RELIED ON FOR SAFETY AND REMOVAL OF IROFSC6 (LAR-10-04) (TAC NO. L32987)

PROPOSED CHANGES

On May 2, 2010, Louisiana Energy Services (LES) transmitted a License Amendment Request (LAR-10-04) to clarify license requirements for administrative control of items relied on for safety (IROFS) boundaries through modification of the Quality Assurance Program Description (QAPD), with associated changes in the Safety Analysis Report (SAR) and Integrated Safety Analysis (ISA) Summary to define and add support equipment within the boundary of Administrative Control IROFS. LAR-10-04 was supplemented by letters dated May 16, 2010, May 23, 2010, May 25, 2010, and May 26, 2010. Additional changes associated with this request include the removal of IROFSC6, exceptions to License Condition (LC) 20 for IROFSC22 and IROFS 38, the inclusion of a subsection to the QAPD for 10 CFR Part 21, Applicability of Support Equipment, and a commitment to install a permanent pressure indicator by November 30, 2010, for IROFS 38.

BACKGROUND

A license to construct and operate a uranium enrichment facility was issued to LES on June 23, 2006. As part of the license application, LES submitted an ISA Summary, as required by 10 CFR 70.61 and 70.62(c)(vi). In the ISA Summary, Administrative Control IROFS were designated to reduce the likelihood of credible high consequence events and credible intermediate consequence events. Each IROFS was demonstrated to be available and reliable to perform its intended function when needed. LES committed to defining the boundary of each IROFS (identifying all supporting systems, subsystems and components that are required to ensure the completion of the safety function) upon completion of the final design of the facility.

On May 3, 2010, Inspection Report No. 70-3103/2010-006 was issued to document findings from operational readiness review team inspections conducted earlier in the year. During the review of implementation of IROFS C6 and 38, the inspectors noted that equipment necessary for those IROFS to be able to accomplish their safety functions were not included in the boundaries as defined in the licensee's boundary definition documents (BDD) and, therefore were not designated as QL-1. These IROFS involves enrichment controls (IROFS C6) and cylinders overfill and rupture controls (IROFS 38). In addition, the inspectors noted that IROFS C6 and 38, as defined, were inconsistent with LC 20 which states that "*currently there are no IROFS that have been specified as using software, firmware, microcode, programmable logic controllers, and/or any digital device, including hardware devices which implement data communication protocols (such as fieldbus devices and Local Area Network controllers), etc. Should the design of any IROFS be change to include any of the preceding features, the licensee shall obtain Commission approval prior to implementing the change(s).*

The license's design changes shall adhere to accepted practices in software and hardware engineering, including software quality assurance controls as discussed in the Quality Assurance Program Description throughout the development process and the applicable guidance of the following industry guidance and regulatory guides as specified in Safety Analysis Report Chapter 3..."

Fuel Cycle Safety and Safeguards Interim Staff Guidance-01, Revision 0, Qualitative Criteria for Likelihood, states, *The IROFS boundary includes everything necessary for the IROFS to perform its intended safety function. For example: (1) the boundary of an enhanced administrative IROFS includes all instrumentation (sensors, annunciators, circuitry, any controls activated by the operator, etc.) relied on to trigger the operator action; (2) the boundary of a simple administrative control includes the equipment necessary to correctly perform the action; and (3) the boundary of an active engineered control includes the attendant instrumentation, sensors, essential utilities, and any auxiliary equipment needed to perform its safety function. The reliability and availability qualities of every component within the IROFS boundary must be considered in evaluating the total IROFS likelihood.*

Specifically, for IROFS38 and C6, a set of the monitoring instruments and supporting equipment used by operations personnel to take actions should be categorized as within the boundary of the IROFS and also meet all IROFS requirements, unless prior U.S. Nuclear Regulatory Commission (NRC) approval is received. This approach intends to provide reasonable assurance that an appropriate level of nuclear and chemical safety is maintained.

LES is proposing to implement the actions summarized in LAR-10-04 to reach a successful resolution to the above mentioned issues.

REGULATORY REQUIREMENTS

Under 10 CFR 70.61, a licensee is required to ensure the risk of credible, high consequence events must be limited. Engineered controls, administrative controls, or both shall be applied to the extent needed to reduce the likelihood of such an event so that, upon implementation of such controls, the event is highly unlikely. The same principle applies to credible intermediate consequence events, such that, through the application of such controls, the event is unlikely. This includes that the risk of nuclear criticality events must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical.

Under 10 CFR 70.62, a licensee is required to establish and maintain a safety program including management measures that demonstrates compliance with the performance requirements of § 70.61. The licensee's management measures are required to ensure that engineered and administrative controls and control systems that are identified as IROFS are designed, implemented, and maintained, as necessary, to ensure they are available and reliable to perform their function when needed, to comply with the performance requirements of § 70.61.

Under 10 CFR 70.64, an applicant or licensee is required to apply baseline design criteria including quality standards and records to the design of new facilities and new processes, and to develop and implement the design in accordance with management measures.

Under 10 CFR 70.62(d), the management measures shall ensure that engineered and administrative controls and control systems that are identified as IROFS pursuant to 70.61(e) of this subpart are designed, implemented and maintained, as necessary, to ensure that they are

available and reliable to perform their function when needed, to comply with the performance requirements of 70.61 of this subpart.

Under 10 CFR 50, Appendix B, a licensee is required to establish a quality assurance program to be applied to the design, fabrication, construction, and testing of structures, systems, and components of a facility.

GUIDANCE

The NRC staff conducted its safety review in accordance with NUREG-1520, "Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility."

STAFF REVIEW AND EVALUATION

ISA

The initial submittal of LAR 10-04 proposed a generic approach for identifying support equipment being within the boundary, but not part of the IROFS. The intent was to identify attributes of support equipment relied upon by the worker to perform the human actions to meet the safety performance requirements of the administrative control, and to verify these attributes through the application of management measures. This generic approach was refined in the May 16, 2010, and May 23, 2010, revisions to identify support equipment based on an imposed Quality Assurance (QA) application. The categories of support equipment are

Monitoring Support Equipment – Installed plant instrumentation providing accurate and reliable indication to the worker performing the safety function. This is within the boundary of the IROFS and is designated a QA level of QL2-AC.

Other (Monitoring) Equipment – Commercial grade equipment used to support a worker action, not within the boundary of the IROFS and designated QL-3.

Operated Support Equipment – Installed plant equipment used by the worker to perform an action related to the safety function and within the IROFS boundary and designated QL2-AC.

Other (Operated) Equipment – Commercial grade equipment used to support a worker action, not within the boundary of the IROFS and designated QL-3.

The attributes of the Support Equipment used to monitor or implement operator actions are verified using appropriate management measures to assure reliable use as needed. These attributes are within the Administrative Control IROFS Boundary. Any removal of management measures designed to provide assurance of the attributes used by the worker or reduction in quality for Support Equipment would be considered a reduction in commitment and require regulatory approval prior to implementation. The attributes of other equipment may also be within the Administrative Control IROFS Boundary, though not the equipment itself, to ensure application of appropriate management measures, such as portable equipment calibration. Any removal of management measures designed to provide assurance of these attributes would also be considered a reduction in commitment and require regulatory approval prior to implementation.

In the May 23, 2010, correspondence, LES defined in the QAPD, a subsection addressing the 10 CFR Part 21, applicability for support equipment. Administrative control IROFS and support equipment (where applicable) required for initial startup are listed in Table 3.4-1 of the ISA. In the future, where additional enhancements are necessary, LES will address such changes in the same manner as this submittal.

The administrative control IROFS impacted are as follows:

IROFS16a

The safety function of IROFS16a is to prevent criticality by administratively limiting moderator in a 30B cylinder prior to filling. Two separate verifications are required, one by use of an endoscope, and one by measuring vapor pressure. Should the endoscope fail, the failure is self revealing. The operator would take corrective actions to repair or replace the endoscope to allow completion of the visual inspection or the cylinder will not be placed into service. With no safety significance associated with failure of the endoscope, it may be classified as QL3. The vapor pressure verification is performed by evacuation of the cylinder and monitoring to detect a pressure increase due to the presence of water vapor. The pressure indicator will be QL-2AC. Because the endoscope and vapor pressure readings are redundant means of providing the same safety function, the staff concludes that their reliability requirements permit the reduced quality assurance levels.

For initial plant operations, the existing local pressure indication will be replaced with a Measuring and Test Equipment (M&TE) indicator for implementation of the IROFS. LES committed in May 25, 2010, correspondence to install a permanent pressure indicator that does not interface with the PCS and meets the requirements of QL-2AC by November 30, 2010.

IROFS38

The safety function of IROFS38 is to prevent cylinder rupture due to overfilling by administratively trending cylinder mass and comparing the trend to expected values. Normal operations require 107 hours to fill a 30B cylinder and 189 hours to fill a 48Y cylinder. An additional 36 to 46 hours (respectively) would be required to fill these cylinders to a potential failure level. This long fill time allows the cylinder weight to be independently tracked along a known trend line. A deviation from the trend would indicate possible failure of the scale. The scale will be QL-2AC. Because of the long fill times, the staff concludes that the reliability requirements of the scale permit a reduced quality assurance level.

IROFSC22

IROFSC22 is evaluated by the staff in the criticality section of this Safety Evaluation Report.

IROFS14(a & b)

IROFS14a and IROFS14b are associated with restricting proximity of vessels in non-designed locations containing enriched uranic material to ensure subcritical conditions. Neither of these IROFS require support equipment within the IROFS boundary.

IROFS30(a, b, & c)

IROFS30a, IROFS30b, and IROFS30c are associated with limiting hydrocarbon oil in enriched uranium product to ensure moderation control assumptions are maintained. None of these IROFS require support equipment within the IROFS boundary.

IROFS31(a, b, & c)

IROFS31a, IROFS31b, and IROFS31c are associated with limiting ^{235}U mass in non-safe-by-design solid waste containers to ensure subcriticality by performing independent sampling and assay analysis. None of these IROFS require support equipment within the IROFS boundary.

IROFS36(a, c, f, & g)

IROFS36a administratively limits transient combustible loading in areas containing uranic material. No support equipment within the IROFS boundary is required.

IROFS36c limits onsite UF_6 cylinder transporters/movers to ensure only use of electric drive or diesel powered vehicles with a fuel capacity of less than 74 gal. Although the fuel tanks, as supplied, are limited to less than 74 gal capacity, the capacity is verified by a Department of Transportation (DOT) certified measuring pump and the vehicle identification number is recorded and a sticker is placed on the vehicle. The pump is only used once per vehicle for certification and verification of the as built fuel capacity of the tank, therefore, the staff agrees that it does not need to be included in the IROFS boundary.

IROFS36f administratively limits designated routes for bulk fueling vehicles onsite to ensure UBC cylinder integrity. No support equipment within the IROFS boundary is required.

IROFS36g administratively limits onsite vegetation fire sources to ensure integrity of important targets. No support equipment within the IROFS boundary is required.

IROFS39(a, b, c, & d)

IROFS39a, IROFS39b, IROFS39c, and IROFS39d are associated with limiting exposure by requiring worker action to evacuate areas of concern to ensure worker consequences from inhalation of uranic material and Hydrogen Fluoride (HF) are low. These worker actions may be implemented as a result of seismic events, fires, material or chemical releases, and severe weather. Each of the initiating events may be detected or reported through multiple means. Therefore, the staff agrees that no support equipment within the IROFS boundary is required.

IROFS50(b, c, d, e, f, & g)

IROFS50b and IROFS50c are associated with controlling the proximity of external site preparation vehicles around areas of concern to prevent an impact resulting in a release of UF_6. Barriers are required to alert the construction vehicle operators that they must stop or alter course. In response to the staff's request for additional information (LES-10-00110-NRC), LES stated that all the exterior barriers listed were capable of performing the required function for all construction vehicles. Because these barriers are commercially available and interchangeable, the staff agrees that they need not be included in the IROFS boundary.

IROFS50d and IROFS50e are associated with controlling the proximity of internal construction vehicles to prevent an impact resulting in a release of UF_6 by use of barriers (IROFS50d) and a spotter (IROFS50e). Because the barriers are standard commercial products such as tape and cones, the staff agrees that they need not be included in the IROFS Boundary.

IROFS50f and IROFS50g are associated with controlling the proximity of external construction cranes around areas of concern to prevent an impact resulting in a release of UF_6 by use of barriers (IROFS50f) and a spotter (IROFS50g). The barriers for IROFS50g are the same as those for IROFS50b and IROFS50c and do not need to be included in the IROFS boundary.

Digital Instrumentation and Control

LC 20 of SNM-2010 states that at the time of licensing, there were no IROFS specified as using software, firmware, microcode, programmable logic controllers, and/or any digital device, including hardware devices which implement data communication protocols (such as fieldbus devices and Local Area Network controllers), etc. Should the design of any IROFS be changed to include any of the aforementioned features, LC 20 requires the licensee to obtain Commission approval prior to implementing the change(s). LC 20 also requires the licensee's design change(s) to adhere to the accepted best practices in software and hardware engineering, including software quality assurance controls as discussed in the QAPD throughout the development process and be in accordance with the applicable guidance of specific industry standards and regulatory guides as cited in SAR Chapter 3.

The Administrative Control IROFS Support Equipment mentioned in LAR-10-04, with the exception of IROFS38 and IROFSC22, meet the requirements of LC 20. The Support Equipment is either mechanical, such as the mechanical process system valves which are locally, manually, operated, or a pressure indication for IROFS16a, which only utilizes an analog to digital converter.

For IROFS38, an exception to LC 20 is requested for the station weighing systems. Each station weighing system consists of four load cells which determine the weight of the cylinder using strain gauges. When weight is placed on the frame, the strain gauge converts the deformation (strain) to an electrical signal. Each load cell sends an electrical signal to a junction box where the signals are electrically combined in a summing junction to provide a single output signal. This junction box is a very simple device consisting of five terminal blocks, one for each load cell, and one for the output signal. Incoming and outgoing signals from the junction box cannot be manipulated. The summed signal is then sent to the SD2100 Weighing Amplifier.

The SD2100 receives the summed signal from the junction box, amplifies it, and coverts it to a digital signal so that it can be displayed in an appropriate weight format. The amplified signal from the SD2100 is then sent to the SD2200 CAN-bus display mounted on the outside of the station. In addition, the amplified signal from the SD2100 is sent to the RS485 bus, which relays the signal to the PCS. The SD2100 has the capability of executing user defined code, but these features are not used in this application. Entering code into the SD2100 Weighing Amplifier would require a change in configuration of the device as currently installed. Management measures are in place to control the configuration of this device as stated in the proposed revision to the QAPD included in LAR-10-04. Any such change would require approval by NRC to ensure that the exception to LC 20 remains acceptable.

For IROFSC22, an exception to LC 20 is requested for the station weighing systems and the cold trap weighing systems. The operation of the station weighing system is the same as that

described above for IROFS38. The cold trap weighing system operation is virtually identical, except that the local display is physically located on the SD2100.

For IROFS38 and IROFSC22, an exception to the requirements of License Condition 20 is granted. The exception to LC 20 is acceptable because this equipment has no impact on the IROFS safety function; therefore, this equipment cannot introduce a significant safety hazard. If an abnormal condition were to occur, the operator would detect the anomaly and take action by closing one of several isolation valves. The valves are Support Equipment for these IROFS, are included in the IROFS boundary, and meet QL-2AC requirements.

Criticality Safety

IROFSC22 is a sole IROFS for ensuring that criticality due to over-enrichment is highly unlikely, based on performing periodic mass balance calculations, which are an indication of significant upsets in the enrichment process. The periodicity is based on ensuring that less than a safe mass of over-enriched material can accumulate between surveillances; the staff therefore considers IROFSC22 to prevent production of a critical mass through ensuring the surveillance is performed sufficiently often.

The staff has determined that IROFSC22 is acceptable as a sole IROFS for limiting the amount of over-enriched material that can accumulate to less than a safe mass, and therefore agrees to the removal of IROFSC6 based on the following considerations. The UF_6 feed and product flow rates are related to the feed, tails, and product enrichments as follows:

$$M_F/M_P = (C_P - C_T)/(C_F - C_T)$$

where M_F and M_P are the feed and product flow rates, and C_F, C_T, and C_P are the feed, tails, and product enrichments. This mass balance equation applies to any enrichment process, and is machine-independent, not taking into account the drop off in machine efficiency as the product enrichment increases. The staff performed a confirmatory analysis using representative values for the required feed rate (based on target SWU production), an initial enrichment of 0.711wt% ^{235}U, a typical tails enrichment of 0.3wt% ^{235}U, and a product enrichment of 5wt% ^{325}U. [redacted] As the enrichment in a cascade increases, the rate at which the higher enrichment is produced decreases in accordance with the above equation. The staff's analysis predicted the product flow rate as a function of product enrichment, assuming that the product from a single aberrant cascade is mixed with the normal (at 5wt% ^{235}U) product from up to 11 additional cascades. The staff then compared the resulting production rate (in $g^{235}U/hr$) to the estimated subcritical mass values from ANSI/ANS-8.1-1998, interpolating between tabulated values as needed, to determine the total time required to reach a safely subcritical mass. The licensee stated that it used a safe mass value of 75% of the minimum critical mass, whereas the subcritical mass limits from ANSI/ANS-8.1 are derived assuming a k_{eff} value of 0.98 (therefore bounding the licensee's more conservative analysis).

The licensee's analysis (document ETC40967220, "Risk of Criticality due to Over-Enrichment"), and staff's confirmatory analysis, demonstrate that the net enrichment and mass accumulation rate depends strongly on the number of operating cascades. As more cascades are brought on-line, the net enrichment drops due to mixing, but the production rate of ^{235}U increases. As a result, the time needed to exceed a safe mass decreases as additional cascades are brought on-line. This would seem to suggest shorter surveillance periods are needed. However, the cascade and associated process equipment are considered safe-by-design (SBD), and thus

have been shown to be subcritical when filled with up to 6wt% ^{235}U. Thus, as long as the net enrichment does not exceed 6wt% ^{235}U, subcriticality is assured.

Considering only the time-to-safe mass for net product enrichments exceeding 6wt% ^{235}U, the staff determined that, in some instances, a safe mass could be reached in less time than the surveillance time proposed by the licensee (i.e., 12 hours for a single operating cascade, 8 hours for two cascades, 6 hours for three cascades, and 12 hours for four or more cascades). The licensee stated that the proposed surveillance intervals were conservative, due to a reduction in machine efficiency as the enrichment increases, and provided an analysis that takes this efficiency into account (Calc-S-00113, IR-3-1000-05, "IROFSC22 Periodicity Calculation"). The licensee stated that its efficiency is manifested as a reduced product flow rate compared to the value using the simple analysis in ETC40967220, and this supports the use of the proposed surveillance periods. The licensee stated that its efficiency is based on the output of the GAPHAL program, which derives product flow rates based on historical data from similar operating centrifuge facilities in Europe. Tables 4 and 5 from Calc-S-00113 show that, in all cases, the time-to-safe mass assuming up to four operating cascades exceeds the proposed surveillance times, whenever the net enrichment exceeds the SBD limit of 6wt% ^{235}U. With more than four operating cascades, there is sufficient mixing with normal product to ensure the SBD limit of 6wt% ^{235}U is not exceeded.

The staff did not have access to the GAPHAL computer code or the historical data upon which the more realistic analysis is based. However, the staff noted that the licensee has committed in its Fundamental Nuclear Material Control Plan (FNMCP) that it will measure enrichment of its product using mass spectrometers, at least once per day initially. [redacted] The licensee is committed to report to the NRC whenever its enrichment exceeds the plant-wide limit of 5wt%, in accordance with 10 CFR 74.11. The LAR also makes reference to these on-line mass spectrometers, cascade sampling rig, and assay sampling rig, for on-line enrichment control. Enrichment is monitored for product quality purposes using the Plant Control System, though this is not credited as part of the over-enrichment accident sequence. The licensee has demonstrated that at least several hours will be required to exceed a safe mass (which is only of concern above the SBD limit of 6wt% ^{235}U), and committed that the enrichment will be closely monitored and reported to the NRC if it exceeds the plant-wide limit of 5wt% ^{235}U. Therefore, the staff has reasonable assurance that a change in mass balance, or measured enrichment, will be detected before an unsafe mass of material enriched in excess of the SBD limit of 6wt% ^{235}U will accumulate, and that criticality due to over-enrichment in the cascade with these controls is highly unlikely.

The staff also took other risk-informed considerations into account in making this determination. [redacted], and that this was for a different centrifuge design that had many design differences (including lacking a mass balance-capable PCS). Given the large number of centrifuges operating in multiple similar facilities, this provides confidence in the technology's ability to control enrichment. Any change in cascade operating parameters sufficiently severe to result in over-enrichment above 6wt% ^{235}U would be detected within a matter of hours. Besides the historical data, there are also other qualitative considerations that were not credited. For example, the UF_6 in the cascade is a low-density gas, and accumulation of more than a safe mass in any location would most likely result from the hydrolysis of UF_6 to UO_2F_2. This can only occur in the presence of water, the introduction of which is precluded by several factors: (1) the cascade operates in a strongly fluorinating environment, which would tend to remove any small amounts of water that could be introduced; (2) the nature of the process is such that significant

wet air in-leakage would cause the machines to fail, which would then be isolated, stopping the enrichment process in the vicinity of the leak; and (3) the process boundary itself constitutes a robust passive engineered barrier against the introduction of moderator. Besides needing the introduction of water, the accumulation of a safe mass only constitutes a concern if the material assumes a nearly spherical accumulation. The gaseous nature of the process means that any accumulation would likely be spread out over a large area, which is geometrically unfavorable for criticality. In addition, it would need to be nearly optimally moderated and reflected by liquid water, which is nearly incredible in the low-pressure fluorinating environment of the cascade. The staff is aware that another centrifuge facility has assigned a likelihood of 10^{-3} to achieving this combination of the right geometry, moderation, and reflection for criticality. (Less optimum conditions could lead to criticality, but would require considerably more than a safe mass before criticality is possible.) The staff considers such a likelihood of achieving a worst-case geometry, moderation, and reflection, to be conservative.

Therefore, based on: (1) the use of mass balance to detect deviations from proper operating parameters, indicating a possible over-enrichment situation; (2) the historically observed drop in product flow rate and cascade efficiency as a function of enrichment; (3) the low mass flow and time required to achieve an over-enrichment situation; (4) the analysis of cascade equipment at 6wt% ^{235}U as SBD; (5) the mass spectrometry, which will be performed at least daily; (6) the requirement to notify the NRC if the plant-wide limit of 5wt% ^{235}U is exceeded; (7) the historical data [redacted]; and (8) the extremely low likelihood of achieving the necessary combination of geometry, moderation, and reflection conditions needed before criticality is possible with a safe mass (ignoring for the moment the use of 75% of a minimum critical mass), given the overall nature of the enrichment process, the staff finds that criticality due to over-enrichment in the cascade will be highly unlikely in accordance with 10 CFR 70.61.

QA

Management Measures

The licensee proposes to add a paragraph in the introduction of Chapter 11 of the SAR to include a discussion of the application of Management Measures to the attributes of Administrative Control of IROFS Support Equipment and other equipment. The proposed addition is not a reduction in commitment and enhances the management measures program. For this reason, the licensee continues to meet the requirements of 10 CFR 70.62 and is acceptable.

Configuration Management

The licensee proposes to add the reference to QA Level 2AC to Section 11.1.1 of the SAR that discusses the safety significance categorization of the system, structures and components in the QAPD. The proposed requirements are graded management measures that will be applied to the Support Equipment of Administrative Control IROFS and other equipment, the SAR continues to meet the requirements of 10 CFR 70.62 and is acceptable.

Maintenance

The licensee proposes to add the reference to QA Level 2AC in Section 11.2.2 "Maintenance Interfaces and Functions," and to Section 11.2.6.4.1 "Periodic Testing," of the SAR.

In Section 11.2.2, the licensee proposes to add QA Level 2AC activities to the activities that are within the QA function approval responsibilities. In Section 11.2.6.4.1, the licensee proposes to perform periodic testing and surveillances to QA Level 2 AC in accordance with written procedures.

The proposed additions are not a reduction in commitments and enhance the management measures program. For this reason, the licensee continues to meet the requirements of 10 CFR 70.62 and is acceptable.

Training and Qualifications

The licensee proposes to provide training and qualification requirements, during design, construction and operations phases for QA training of personnel performing QA Level 2 AC work activities. The proposed change is not a reduction in commitments and enhances the management measures program. For this reason, the licensee continues to meet the requirements of 10 CFR 70.62 and is acceptable.

Other QA Elements

In section 11.8, "Other QA Elements," of the SAR, the licensee proposes to add the new designation level Quality Level 2AC (QL-2AC) to Appendix A of the QAPD, to be applied to Support Equipment of Administrative Control IROFS. General requirements for QL-2AC include the identification of the activities in applicable QA Procedures, implementing documents and documents specifying quality requirements for prescribing activities affecting quality. These requirements, as described by the licensee will also be implemented by their contractors through the use of approved QA programs and procedures.

For QL-2AC, the licensee proposes that any removal of the management measures designed to provide assurance of the Support Equipment relied upon by the worker, or removal of the Support Equipment quality requirements from the Administrative Control IROFS Boundary will be considered a reduction in commitments and will require the licensee to require NRC approval prior to implementation.

In addition, for QL-3 requirements, the licensee proposes to add additional wording similar to the QL-2AC requirement on removal of management measures and reduction of commitments. The licensee states that for any removal of the management measures designed to provide assurance of the other equipment attributes identified in proposed Table 3.4-1 of the Safety Analysis Report, that are used by the worker will be considered a reduction in commitments and will require the licensee to seek NRC approval prior to implementation.

The proposed changes use a graded approach to be applied to the Support Equipment of Administrative Control IROFS and other equipment, the SAR continues to meet the requirements of 10 CFR 70.62 and is acceptable.

QAPD, Section 1 – Organization

The licensee proposes to add QA Level 2AC activities to those that are required to meet the requirements of the QAPD for the delegation of work. ASME NQA-1, Basic Requirement 1, "Organization," states "[t]he individual(s) or organization(s) responsible for establishing and executing a quality assurance program under this Standard may delegate any or all of the work to others but shall retain responsibility there for." The requirements for the delegation of work

have not changed. For this reason, the QAPD continues to meet the requirements of ASME NQA-1, Basic Requirement 1, and is acceptable.

QAPD, Section 2 – Quality Assurance Program

The licensee proposes to add the new designation of QA Level 2AC to be applied to Administrative Control IROFS Support Equipment for Administrative Control IROFS. ASME NQA-1, Basic Requirement 2, "Quality Assurance Program," states that "[t]he program shall provide control over activities affecting quality to an extent consistent with their importance." The Administrative Control IROFS Support Equipment, as described by the licensee, is not "items which are determined to be essential to the function of the IROFS." In addition, the description also states that these items will be used by the worker to perform the human action of the Administrative Control IROFS and the items are not essential to any passive or active engineered safety feature that must operate without any human interaction. The applicant will consider a reduction in commitments any removal of the management measures designed to provide assurance of the Administrative Control of IROFS Support Equipment used by the worker, or any removal of the Administrative Control of IROFS Support Equipment quality requirements from the Administrative Control IROFS Boundary. For changes that include any reduction in commitments, the licensee will seek NRC approval prior to implementation.

In addition, for QL-3 requirements the licensee proposes to add additional wording similar to the QL-2AC requirement on removal of management measures and reduction of commitments. The licensee states that for any removal of the management measures designed to provide assurance of other equipment attributes identified in proposed Table 3.4-1 of the Safety Analysis Report, that are used by the worker will be considered a reduction in commitments and will require the licensee to require NRC approval prior to implementation.

The licensee proposes to add QA Level 2AC activities to those inspection, test and nondestructive examination activities that require personnel to be certified in accordance with LES procedures that meets the requirements of NQA-1-1994 Part I Supplement 2S-1, "Supplementary Requirements for the Qualification of Inspection and Test Personnel" and Supplement 2S-2, "Supplementary Requirements for the Qualification of Nondestructive Examination Personnel."

The propose changes enhance the QAPD with additional information on the designation Level of QA Level 2AC designations, does not reduce any commitments and continues to meet the requirements of NQA-1, Basic Requirement 2, and is acceptable.

QAPD, Section 18 – Audits

The licensee proposes to add QA Level 2AC activities to those activities that require, as a minimum, internal audits at least once per year or once during the lifetime of the activity, whichever is shorter. ASME NQA-1, Basic Requirement 18, "Audits," states that "[p]lanned and scheduled audits shall be performed to verify compliance with all aspects of the quality assurance program and its effectiveness." The requirements for audits have not changed. For this reason, the QAPD continues to meet the requirements of ASME NQA-1, Basic Requirement 18, and is acceptable.

QAPD, Section 19 – Provisions for Change

The licensee proposes to add a new subsection, "10 CFR 21 Applicability for Support Equipment," to establish the criteria that was considered for the determination of the 10 CFR 21 applicability on Administrative Control IROFS Support Equipment. 10 CFR 21 states that "[t]hat section requires any individual director or responsible officer of a firm constructing, owning, operating or supplying the components of any facility or activity which is licensed or otherwise regulated pursuant to the Atomic Energy Act of 1954, as amended, or the Energy Reorganization Act of 1974, who obtains information reasonably indicating: (a) That the facility, activity or basic component supplied to such facility or activity fails to comply with the Atomic Energy Act of 1954, as amended, or any applicable rule, regulation, order, or license of the Commission relating to substantial safety hazards or (b) that the facility, activity, or basic component supplied to such facility or activity contains defects, which could create a substantial safety hazard, to immediately notify the Commission of such failure to comply or such defect, unless he has actual knowledge that the Commission has been adequately informed of such defect or failure to comply."

In this new subsection, the licensee states that the loss of Administrative Control IROFS Support Equipment must not represent a loss of a specified function of the IROFS. As described by the licensee, if such support equipment fails, other available equipment and sufficient time to evaluate and take actions will be available to the worker. In addition, the licensee explains that the use of this equipment is a precursor for the worker to take action. Upon failure, the result will be a failure in the precursor action and the evolution will be terminated before the accident could occur. The licensee does not anticipate any Administrative Control IROFS Support Equipment to have a failure that could result in a consequence meeting the criteria of a substantial safety hazard; however, the licensee clarifies that 10 CFR Part 21 will be applicable if the criteria are met by any Administrative Control IROFS Support Equipment. For this reason, the new subsection does not constitute a reduction in commitments, continue to meets 10 CFR 21, and is acceptable.

QAPD, Section 22 – Quality Assurance Program for Quality Assurance Level 2AC

The licensee proposes to add a new Quality Assurance Program that will establish the requirements for QA Level 2AC components to ensure that QA Level 2AC Support Equipment will fulfill their intended function commensurate with worker reliance on the equipment. 10 CFR 70.62 states "The measures applied to a particular engineered or administrative control or control system may be graded commensurate with the reduction of the risk attributable to that control or control system." In addition, ASME NQA-1, Basic Requirement 2, "Quality Assurance Program," states that "[t]he program shall provide control over activities affecting quality to an extent consistent with their importance."

As described by the applicant, the QA Level 2AC Program will be based on the following: (1) management measures will be identified in accordance with LES procedures; (2) activities for QL-2AC components will include initial calibration and periodic in-service calibration to ensure reliability and accuracy; and (3) the activities included here are those that do not meet the QA Level 1 or QA Level 1 Graded.

The QA Level 2AC Program describes the following areas in subsections:

1. Organization – Organization, lines of responsibility, and authority will be established and documented.

2. Quality Assurance Program – The licensee will assess the adequacy of the program providing indoctrination and training, as necessary, of personnel performing activities affecting quality to assure QL-2AC effective implementation.

3. Design Control, Design Documentation and Records – LES will specify applicable design requirements of QL-2AC components, and these components will be identified in applicable design documents.

4. Procurement – QL-2AC components will be procured in accordance with the QL-3 requirements. The process will include requirements for formal interfaces between licensee and supplier, identification of specific terms and conditions, procurement planning, complete and accurate description of needs, reviews and approvals by knowledgeable and responsible individuals, technical and quality requirements, verification of technical adequacy and completeness, design review, change review and approval, identification of deviations by suppliers, methods of acceptance, procurement package closure and documentation.

5. Instructions, Procedures, and Drawings – Activities affecting quality will be prescribed by and conducted in accordance with approved procedures and other implementing documents appropriate to the circumstances and to the level of detail necessary. Work activities will be performed in accordance with written procedures.

6. Document Control – The requirements for the identification, generation, and control of Quality Assurance Documents for the QL-2AC components will be in accordance with the requirements of Section 6 of the QAPD.

7. Control of Purchased Material, Equipment, and Services – Measures will be established to ensure conformance with procurement specifications and documents. The licensee will define critical elements applicable to the components' material.

8. Identification and Control of Material, Parts, and Components – Implementing procedures will require and specify the controls necessary to ensure that only correct and accepted items are used or installed.

9. Control of Special Processes – Not applicable to QL-2AC components.

10. Inspection – The inspections required to verify conformance of an item or activity to specified requirements will be planned and executed, including characteristics to be inspected and inspection methods. The inspection results will be documented.

11. Test Control – The controls for testing of QL-2AC components will be provided in procedures.

12. Control of M&TE – M&TE will be controlled, calibrated, and adjusted at specified periods in accordance with written procedures to maintain accuracy within the specified limits. The licensee provides the requirements for calibration, documentation, handling, and storage. In addition, the Quality Assurance Program for QL-2AC includes provisions for documenting the use of M&TE, out of calibration M&TE, lost M&TE, and commercial devices.

13. Handling, Storage, and Shipping – Handling, storage, cleaning, packaging, shipping, and preservation of QL-2AC components will be controlled in accordance with requirements of work control documents, shipping instructions, or other specified documents, as applicable, to prevent damage or loss and to minimize deterioration.

14. Inspection, Test and Operating Status – Status of inspection and test activities associated with QL-2AC components will be identified. Status will be indicated on the items or documents traceable to the items to assure that required inspections and tests are performed and to assure that items that have not passed the required inspections and tests are not inadvertently used. Inoperable components will be identified appropriately during operations.

15. Nonconforming Items – Controls for the nonconforming items for the QL-2AC components will be in accordance of Section 15 of the QAPD.

16. Corrective Actions – Requirements for the corrective action for the QL-2AC components will be in accordance of Section 16 of the QAPD.

17. Quality Assurance Records – Requirements for the identification, generation, and control of Quality Assurance Records for the QL-2AC components will be in accordance of Section 17 of the QAPD.

18. Audits – Requirements for the auditing for the QL-2AC components will be in accordance of Section 18 of the QAPD.

19. Provisions for Change – Any removal of the management measures designed to provide assurance of the Administrative Control of IROFS Support Equipment used by the worker, or any removal of the Administrative Control of IROFS Support Equipment quality requirements from the Administrative Control IROFS Boundary constituting any reduction in commitments will require NRC approval prior to implementation.

The QA Program for Quality Level 2AC discusses the requirements for QL-2AC components that are primarily Administrative Control IROFS Support Equipment. The program provides reasonable assurance that QA Level 2AC Support Equipment will fulfill their intended function commensurate with worker reliance on the equipment. For this reason, the new section does not constitute a reduction in commitments, continue to meets 10 CFR 70.62 and ASME NQA-1 Basic Requirement 2, and is acceptable.

FINDINGS

The amendment request provides reasonable assurance that all credible intermediate consequences, from radiological or chemical releases, are unlikely; and all credible high consequence accidents are highly unlikely. The NRC finds the licensee provides reasonable assurance that the IROFS addressed by these licensing actions will ensure compliance with the performance requirements of 10 CFR 70.61. The staff finds modifications to the QAPD and other Licensing Basis Documents, to define and add support equipment within the boundary of Administrative IROFS to be acceptable. The action for the removal of IROFSC6, and the designation of IROFSC22 as a sole IROFS has been reviewed by the staff and is acceptable. The exceptions to LC 20 for IROFSC22 and IROFS38 have been reviewed and are acceptable. The subsection to the QAPD for 10 CFR Part 21 has been reviewed and is acceptable. The

staff concludes that the proposed revisions to the LES license are acceptable, consistent with the requirements of 10 CFR Parts 20, 30, 40, and 70, and should be approved.

ENVIRONMENTAL REVIEW

Issuance of the requested amendment to the LES license is subject to the categorical exclusion provided in 10 CFR 51.22(c)(11) and will not have a significant impact on the human environment. Therefore, neither an environmental assessment nor an environmental impact statement is required for the proposed action.

CONCLUSIONS

Based on its review and evaluation provided by LES in its LAR dated May 2, 2010, and supplemental information provided on May 16, 2010, May 23, 2010, May 25, 2010, and May 26, 2010, the NRC staff finds that the proposed revisions to the LES license to be acceptable, consistent with the requirements of 10 CFR Parts 20, 30, 40, and 70, and should be approved.

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References

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