Failures associated with PFPE oil and PFPE oil recovery is evaluated in the Integrated Safety Analysis.

6.2.1.2.2 Chemical Traps - Activated Carbon, Aluminum Oxide, and Sodium Fluoride

Adsorption is the attraction of gas molecules to the surface of an activated solid. There are two classifications of adsorption: physical and chemical. At ordinary temperatures, adsorption is usually caused by molecular forces rather than by the formation of chemical bonds. In this type of adsorption, called physical adsorption, very little heat is evolved. If a chemical reaction takes place between the gas and the solid surface, the process is known as chemisorption. In chemisorption the reaction between surface and gas molecules occurs in a stoichiometric manner, and heat is liberated during the reaction.

Chemisorption is used in the removal of UF_6 and HF from gaseous effluent streams. It is also used to remove oil mist from vacuum pumps operating upstream of gaseous effluent ventilation systems. Adsorbent materials are placed on stationary beds in chemical traps downstream of the various cold traps. These materials capture HF and the trace amounts of UF_6 that escape desublimation during feed purification or during venting of residual UF_6 contained in hoses and/or piping that is bled down before disconnection.

The chemical traps are placed in series downstream of the cold traps in the exhaust streams to the GEVS and may include one or more of a series of two different types of chemical traps. The first type of trap contains a charge of activated carbon to capture the small amounts of UF_6 that escape desublimation. Since chemisorption is a pressure sensitive process, HF is not fully adsorbed on carbon at low pressures. This necessitates a second type of trap containing a charge of aluminum oxide (Al2O3) to remove HF from the gaseous effluent stream. One or more of a series of these traps is used depending on the process system being served. Additionally, an oil ~~carbon~~ trap is present on the inlet of the vacuum pumps which discharge to the GEVS to prevent any of the pump oil from migrating back into the UF_6 cold traps. | LBDCR-11-0007

Chemisorption of UF_6 on activated carbon evolves considerable thermal energy. This is not normally a problem in the chemical traps downstream of the cold traps because very little UF_6 escapes desublimation. If multiple equipment failures and/or operator errors occur, significant quantities of UF_6 could enter the chemical traps containing activated carbon. This could cause significant overheating leading to release. Failures associated with the carbon traps were evaluated in the Integrated Safety Analysis.

Activated carbon cannot be used in the Contingency Dump System because the relatively high UF_6 flow rates during this non-routine operation could lead to severe overheating. A chemical trap containing sodium fluoride (NaF) is installed in the contingency dump flow path to trap UF_6. NaF is used because the heat of UF_6 chemisorption on NaF is significantly lower than the heat of UF_6 chemisorption on activated carbon. Failures associated with the NaF traps were evaluated in the integrated safety analysis.

There are no specific concerns with heat of adsorption of either UF_6 or HF with Al2O3. Failures associated with the aluminum oxide traps were evaluated in the Integrated Safety Analysis.

The properties of these chemical adsorbents are provided in Table 6.2-1, Properties of Chemical Adsorbents.

238 (^{238}U), approximately 0.0058 $^{w}/_{o}$, 0.711 $^{w}/_{o}$ and 99.28 $^{w}/_{o}$ respectively. ^{235}U, unlike ^{238}U, is fissile and can sustain a nuclear chain reaction. Light water nuclear power plants (the type in the United States) normally operate on fuel containing between 2 $^{w}/_{o}$ and 5 $^{w}/_{o}$ ^{235}U (low-enriched uranium); therefore, before natural uranium is used in uranium fuel for light water reactors it undergoes "enrichment."

In performing this enrichment, the NEF will receive and enrich natural uranium hexafluoride (UF_6) feed. The isotopes are separated in gas centrifuges arranged in arrays called cascades.

This process will result in the natural UF_6 being mechanically separated into two streams: (1) a product stream which is selectable up to the LES license limit in isotope~~a maximum 5 $^{w}/_{o}$~~ ^{235}U ~~enrichment~~, and (2) a tails stream which is depleted to low percentages of ^{235}U (0.32 $^{w}/_{o}$ on average). No chemical reaction occurs during enrichment. Other processes at the plant include product blending, homogenizing and liquid sampling to ensure compliance with customer requirements and to ensure a quality product. LBDCR-11-0030 I

The enrichment process is comprised of the following major systems:

- UF_6 Feed System
- Cascade System
- Product Take-Off System
- Tails Take-Off System
- Product Blending System
- Product Liquid Sampling System.

UF_6 is delivered to the plant in ANSI N14.1 standard Type 48Y international transit cylinders, which are placed in a feed station and connected to the plant via a common manifold. Heated air is circulated around the cylinder to sublime UF_6 gas from the solid phase. The gas is flow controlled through a pressure control system for distribution to the cascade system at subatmospheric pressure.

Individual centrifuges are not able to produce the desired product and tails concentration in a single step. They are therefore grouped together in series and in parallel to form arrays known as cascades. A typical cascade is comprised of many centrifuges.

UF_6 is drawn through cascades with vacuum pumps and compressed to a higher subatmospheric pressure at which it can desublime in the receiving cylinders. Highly reliable UF_6 resistant pumps will be used for transferring the process gas.

Tails material and product material are desublimed at separate chilled take-off stations. Tails material is desublimed into 48Y cylinders. Product material is desublimed into 30B cylinders.

With the exception of liquid sampling operations, the entire enrichment process operates at subatmospheric pressure. This safety feature helps ensure that releases of UF_6 or HF are minimized because leakage would typically be inward to the system. During sampling operations, UF_6 is liquefied within an autoclave which provides the heating required to homogenize the material for sampling. The autoclave is a rated pressure vessel which serves as secondary containment for the UF_6 product cylinders while the UF_6 is in a liquid state.

protective action to escape a release area upon detecting any significant HF odor. (See and flee)

- Other facilities have successfully assumed that the gas hemisphere radius expands at a rate of 1 m/s and the receptor (facility worker) walks away from the release point at 1 m/s within the cloud. This assumption is supported by the Society of Fire Protection Engineers which reference:
  - 1.27 m/s (250 ft/min) for minimum crowd conditions, and
  - 1.02 m/s (200 ft/min) for moderate crowd conditions for fire evacuation.

  Workers in restricted areas could evacuate at a faster rate, putting themselves ahead of the leading edge of the expanding cloud or minimizing exposure during evacuation even if they evacuate in the direction of the plume. At a speed of 1 m/s, facility workers originally at the release point are outside the immediate area of the release (i.e., 1.5 m radius) in less than 2 seconds, and are accurately classified as facility workers for consequence assessments. (Worker evacuation speed)
- Consistent with the Safety Evaluation Report for the NEF, Appendix A (Reference 9), a time weighted average (TWA) of dose or exposure is acceptable to calculate consequences to the workers in the room. The use of the TWA concept combined with the other concepts discussed here demonstrated that the risk of exposure is minimal to the facility worker that causes the release. For example, at the intermediate consequence threshold of 78 mg/m^3 HF, the TWA contribution of the former "local worker" 10-second exposure over 2.5 minutes is merely 5.2 mg/m^3 HF (78 mg/m^3 HF x 10 sec/150 sec). (Time weighted average)
- Consequence methodology applies the 10-minute AEGL limits for the facility worker. These limits are 10-minute exposures that are applied to the 2.5-minute exposure; therefore, there is a built-in conservatism that applies to all consequence analysis. The conservatism is due to the more stringent AEGL values for 10-minute exposure being applied to the shorter 2.5-minute facility worker exposure. (AEGL 10-min limit)

~~IROFS39c administratively limits exposure by requiring worker action to evacuate the area(s) of concern in the event of a release to ensure worker consequences of inhalation of uranic material and HF is low. Management measures provide reasonable assurance that IROFS39c will be an effective control when required. Implementation of IROFS39c through an approved procedure ensures that workers will respond promptly to any chemical release and take immediate action to avoid ever-exposures.~~ LBDCR-11-0007

Another assumption made in conducting consequence severity analysis is that for releases precipitated by a fire event, only public exposure was considered in determining consequence severity; worker exposures were not considered. The worker is assumed to evacuate the area of concern once the fire is detected by the worker. Fires of sufficient magnitude to generate chemical/radiological release must either have caused failure of a mechanical system/component or involve substantive combustibles containing uranic content. In either case, the space would be untenable for unprotected workers. Sufficient time is available for the worker to reliably detect and evacuate the area of concern prior to any release. Fire brigade/fire department members responding to emergencies are required by emergency response procedure (and regulation) to have suitable respiratory and personal protective equipment.

6.6 Chapter 6 Tables

Table 6.1-2 Separations Building Modules

Chemical/Product			Inventory by Location					~~Notes~~
Name	Formula	Physical State	UBC Storage Pad (outdoor) – ~~s~~See Note~~s~~ 3, 5	UF_6 Handling Area (Each~~All~~ SBM~~s~~) See Note 2	Cascade Halls	Second Floor Process Services Area See Note 4	Blending and Liquid Sampling Area ~~(All SBMs)~~See Note 1	~~1, 2, and 3~~
Uranium hexafluoride	UF_6	Solid	1.97~~2.15~~ E8 kg (4.34~~4.75~~ E8 lb)	4.00~~4.23~~ E5 kg (8.82~~9.32~~ E5 lb)			9,108 kg (20,079 lb)	~~1~~
Uranium hexafluoride	UF_6	Liquid					2,277 kg (5,020 lb)	~~4~~
Uranium hexafluoride	UF_6	Gas		piping	SBM-1001 128~~256~~ kg/hall (282~~565~~ lb/hall) SBM-1003 TBD kg/hall (TBD lb/hall)	SBM-1001 13.8 kg/hall (30.4 lb/hall) SBM-1003 TBD kg/hall (TBD lb/hall)	3 kg (6.6 lb)	
Hydrogen fluoride	HF	gas		Piping (trace)				

Notes:

1. The Blending and Liquid Sampling Area can have up to 2 (30B) cylinders in donor stations and 2 (30B) cylinders in receiver stations. One (30B) cylinder can be present in each liquid sampling autoclave~~s~~ and will be in various physical states depending on sampling in progress.
2. For one assay in the UF_6 Handling Area the ~~inventory is~~ maximum estimated operational inventory (5 feed [48Y], 11 tails [48Y], and 5 product [30B] cylinders.
3. The UBC Storage Pad is located outside of and detached from the Separations Building.
4. Normal estimated operational inventory in piping. Gas flows in piping routed from the UF_6 Handling Area to the Cascade Halls and back. The Process Services Area contains the main manifolds and valve stations.

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5. Not to exceed Material License Condition 8.A for natural and depleted uranium. ~~of 136,120,000 kg U~~	LBDCR-11-0030

6.6 Chapter 6 Tables

Table 6.3-4 ERPG and AEGL values for Uranium Hexafluoride (as soluble U)

ERPG and AEGL Values For UF_6 (values in mg soluble U/m^3)							
ERPG		**AEGL**					
	1-hr		**10-min**	**30-min**	**1-hr**	**4-hr**	**8-hr**
ERPG-1	3.4	**AEGL-1**	2.4	2.4	2.4	NR	NR
ERPG-2	10	**AEGL-2**	19	13	6.5	1.6	0.8
ERPG-3	20	**AEGL-3**	146	49	24	6.1	3.1

Table 6.3-5 Definition of Consequence Severity Categories

		High Consequence (Category 3)	Intermediate Consequence (Category 2)	
Acute Radiological Doses	Worker	>100 rem TEDE	>25 rem TEDE	
	Environment (Outside Restricted Area)	*	*	LBDCR-11-0007
	Outside Controlled Area	>25 rem TEDE	>5 rem TEDE	
Acute Radiological Exposure	Worker	~~not applicable~~*	~~not applicable~~*	
	Environment (Outside Restricted Area)	*	> 5.4 mg U/m^3 (24-hr average)	LBDCR-11-0007
	Outside Controlled Area	>30 mg U intake	~~>5.4 mg U/m^3 (24-hr average)~~*	
Acute Chemical Exposure				
	Worker	>146 mg U/m^3; > 139 mg HF/m^3	>19 mg U/m^3; >78 mg HF/m^3	
	Environment (Outside Restricted Area)	*	*	
	Outside Controlled Area (30-min exposure)	>13 mg U/m^3; >28 mg HF/m^3	>2.4 mg U/m^3; >0.8 mg HF/m^3	LBDCR-11-0007

* - Not a 10 CFR 70.61 performance requirement.

Table 6.3-6 Health Effects from Intake of Soluble Uranium

Health Effects	Uranium Intake (mg) by 70 kg Person
50% Lethality	230
Threshold for Intake Resulting in Permanent Renal Damage	40
Threshold for Intake Resulting in No Significant Acute Effects	10
No Effect	4.3

7.1 Fire Safety Management Measures

Fire safety management measures establish the fire protection policies for the site. The objectives of the fire safety program are to prevent fires from starting and to detect, control, and extinguish those fires that do occur. The fire protection organization and fire protection systems at the NEF provide protection against fires and explosions based on the structures, systems, and components (SSC) and defense-in-depth practices described in this chapter.

7.1.1 Fire Protection IROFS

IROFS associated with fire protection are specified in the NEF Integrated Safety Analysis Summary.

7.1.2 Management Policy and Direction

Louisiana Energy Services (LES) is committed to ensuring that the IROFS, as identified in the ISA Summary, are available and reliable, and that the facility maintains fire safety awareness among employees, controls transient ignition sources and combustibles, and maintains a readiness to extinguish or limit the consequences of fire. The facility maintains fire safety awareness among employees through its General Employee Training Program. The training program is described in Chapter 11, Management Measures.

The responsibility for fire protection rests with the Health, Safety and Environmental Manager who reports directly to the ~~Vice President~~Director of Compliance~~/General Counsel~~. The Health, Safety and Environmental Manager is assisted by the Fire Protection Officer. Fire protection engineering support is provided by the Engineering Manager. The personnel qualification requirements for the ~~Plant Support Director~~Engineering Manager and the Fire Protection Officer are presented in Chapter 2, Organization and Administration. LBDCR-11-0031 LBDCR-11-0031

The Fire Protection Officer is trained in the field of fire protection and has practical day-to-day fire safety experience at nuclear facilities. The Fire Protection Officer is responsible for the following:

- Fire protection program and procedural requirements
- Fire safety considerations
- Maintenance, surveillance, and quality of the facility fire protection features
- Review of design changes and training programs as they relate to fire protection
- Documentation and record keeping as they relate to fire protection
- Fire prevention activities (i.e., administrative controls and training)
- Fire brigade organization and training
- Pre-fire planning.

The facility maintains a Safety Review Committee (SRC) that reports to the Plant Manager. The SRC performs the function of a fire safety review committee. The SRC provides technical and administrative review and audit of plant operations including facility modifications to ensure that fire safety concerns are addressed.

7.6 References

Edition of Codes, Standards, NRC Documents, etc that are not listed below are given in ISAS Table 3.0-1.

CFR, 2003a, Title 10, Code of Federal Regulations, Section 70.62, Safety program and integrated safety analysis, 2003.

CFR, 2003b, Title 10, Code of Federal Regulations, Section 70.22, Contents of applications, 2003.

CFR, 2003c, Title 10, Code of Federal Regulations, Section 70.65, Additional content of applications, 2003.

CFR, 2003d, Title 10, Code of Federal Regulations, Section 70.61, Performance requirements, 2003.

CFR, 2003e.,Title 10, Code of Federal Regulations, Section 70.64, Requirements for new facilities or new processes at existing facilities, 2003.

NRC, 1995, NRC Staff Technical Position on Fire Protection for Fuel Cycle Facilities, Generic Letter 95-01, U.S. Nuclear Regulatory Commission, January 1995.

ASME B18.6.4-1998 (R2005), "Thread Forming and thread Cutting Tapping Screws and Metallic Drive Screws – Inch"

ASTM A653 / A653M-01, Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by Hot Dip Process

LBDCR-11-0035

ASTM A924 –A924M – 10a, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process

ASTM E84, 2001, Test Method For Surface Burning Characteristics of Building Material.

ASTM E 119, 2000, Standard Test Methods for Fire tests of Building Construction and Materials.

ASTM E814, 2002, Standard test Method for Fire test of Through-Penetration Fire Stops.

FF-S-325, "Federal Specification: Shield, Expansion; Nail, Expansion; And Nail, Drive Screw (Devices, Anchoring, Masonry)"

ICC-ES Evaluation Report ESR-1671, "Tapcon with Advanced Threadform Technology Anchors"

LBDCR-11-0035

NFPA 80, 1999, Standard for Fire Doors and Fire Windows.

NFPA 80A, 1993, Exterior Fire Exposures.

NFPA 90A, 2002, Standard for the Installation of Air Conditioning and Ventilating Systems.

NFPA 221, 1997, Standard for Fire Walls and Fire Barrier Walls.

7.6 References

NFPA 251, 1995, Standard Methods of Tests of Fire Endurance of Building Construction and Materials.

NFPA 252, 1999, Standard Methods of Fire Tests of Door Assemblies.

NFPA 801, 2003, Standard for Fire Protection for Facilities Handling Radioactive Materials.

SAE J933, "Mechanical and Quality Requirements for Tapping Screws, " August 1, 2005

LBDCR-11-0035

UL Fire Resistance Directory, 2000 or later.

UL 10B, 1997, Standard for Safety Fire Tests of Door Assemblies

UL 555, 1999, Standard for Safety Fire Dampers

NFPA 220, 1999, Standard on Types of Building Construction

International Building Code, 2003, (as amended by the New Mexico Commercial Building Code)

11.2.6.3 IROFS Preoperational Functional Testing

Preoperational Functional Tests are completed prior to UF_6 introduction into an SSC to which the particular IROFS applies.

The IROFS Preoperational Functional Test Plan is available to the NRC prior to the start of testing. Revisions to the Preoperational Functional Test Plan are also made available to the NRC. Preoperational Functional Testing as a minimum includes all system or component tests required by the pertinent design code which were not performed by the constructor prior to turnover. In addition, preoperational tests include all testing necessary to demonstrate that the IROFS are capable of performing their intended function.

Preoperational Functional Testing is conducted to determine facility parameters and to verify the capability of IROFS SSCs to meet performance requirements.

The overall Preoperational Functional Testing program is reviewed, prior to initial UF_6 introduction, by the Plant Manager and all affected Functional Area Managers to ensure that all prerequisite testing is complete.

11.2.6.4 IROFS Operational Functional Testing

The Operational Testing program consists of periodic testing and special testing. Periodic testing is conducted at the facility to monitor various facility parameters and to verify the continuing integrity and capability of facility IROFS. Special testing which may be conducted at the facility is testing which does not fall under any other testing program and is of a non-recurring nature.

The Maintenance Manager has overall responsibility for the development and conduct of the Operational Functional Testing program and in conjunction with the Shift Operations Manager and the Licensing Manager ensures that all testing commitments and applicable regulatory requirements are met.

The Health, Safety, and Environmental Manager and ~~Plant Support~~ Director of Compliance shall ensure that new surveillance requirements or testing commitments are identified to the Maintenance Manager. The Maintenance Manager assigns responsibility for new testing requirements. | LBDCR-11-0031

Surveillance requirements and procedures are identified and responsibility assigned to complete these requirements within specified intervals.

Operations Shift Managers or designees are also used for operational testing. The Operations Shift Managers or designee has the responsibility to be thoroughly familiar with the SSCs and the procedure(s) used for testing.

The Operations Shift Managers or designees have the following responsibilities regarding the conduct of testing:

A. Verification of all system and facility prerequisites

B. Observance of all limits and precautions during the conduct of the test

A. Personnel access procedures ensure the completion of nuclear safety training prior to permitting unescorted access into the Controlled Access Area.

B. Training sessions covering criticality safety, radiation protection and emergency procedures are conducted on a regular basis to accommodate new employees or those attending continuing training. Topics covered in these sessions depend upon the job responsibilities and include the following – when applicable to the job responsibility:

- Notices, reports and instructions to workers
- Practices designed to keep radiation exposures ALARA
- Methods of controlling radiation exposures
- Contamination control methods (including decontamination)
- Use of monitoring equipment
- Emergency procedures and actions
- Nature and sources of radiation
- Safe use of chemicals
- Biological effects of radiation
- Use of personnel monitoring devices
- Principles of nuclear criticality safety
- Risk to pregnant females
- Radiation protection practices
- Protective clothing
- Respiratory protection
- Personnel surveys.

Criticality safety training shall be in accordance with ANSI/ANS-8.19 and ANSI/ANS-8.20.

Individuals attending these sessions must pass an initial examination covering the training contents to assure the understanding and effectiveness of the training. The effectiveness of the training programs is also evaluated by audits and assessments of operations and maintenance personnel responsible for following the requirements related to the topics listed above.

Newly hired or transferred employees reporting for work prior to the next regularly scheduled training session must complete nuclear safety training prior to unescorted access into the Controlled Access Area.

Since contractor employees perform diverse tasks in the Controlled Access Area, training for these employees is designed to address the type of work they perform. In addition to applicable radiation safety topics, training contents may include Radiation Work Permits, special bioassay sampling, and special precautions for welding, cutting, and grinding in the Controlled Access Area.

These training programs are conducted by instructors assigned by the Training ~~and Support Services~~ Manager as having the necessary knowledge to address criticality safety and radiation protection. Records of the training programs are maintained as described in Section 11.7, "Records Management." LBDCR-11-0031

C. Individuals requiring unescorted access to the Controlled Access Area receive annual continuing training.

D. Contents of the nuclear safety training programs and the radiation protection programs are reviewed and updated through curriculum meetings at least every two years. These safety training programs curriculum meetings is are chaired by the Plant Support Director, or designee. The radiation protection programs curriculum meeting is chaired by the Director of Compliance, or designee. LBDCR-11-0031

E. Operational personnel are further instructed in the specific safety requirements of their work assignments by qualified personnel during on-the-job training. Employees must demonstrate understanding of work assignment requirements based on observations by qualified personnel before working without direct supervision. Changes to work procedures including safety requirements are reviewed with operational personnel by their immediate supervisor or delegate.

11.3.3.1.2 Fire Brigade Training

The primary purpose of the Fire Brigade Training Program is to develop a group of facility employees skilled in fire prevention, fire fighting techniques, first aid procedures, and emergency response. They are trained and equipped to function as a team for the fighting of fires. The intent of the facility fire brigade is to be a first response effort designed to supplement the local fire department for fires at the plant. The facility fire brigade is not intended to replace local fire fighters.

The Fire Brigade Training Program provides for initial training of all new fire brigade members, semi-annual classroom training and drills, annual practical training, and leadership training for fire brigade leaders.

11.3.3.2 Technical Training

Technical training is designed, developed and implemented to assist facility employees in gaining an understanding of applicable fundamentals, procedures, and practices related to IROFS. Also, technical training is used to develop manipulative skills necessary to perform assigned work related to IROFS. Technical training consists of four segments:

- Initial Training
- On-the-Job Training and Qualifications
- Continuing Training
- Special Training.

11.3.3.2.1 Initial Training

Initial job training is designed to provide an understanding of the fundamentals, basic principles, and procedures involved in work related to IROFS that an employee is assigned. This training may consist of, but is not limited to, live lectures, taped and filmed lectures, self-guided study, demonstrations, laboratories and workshops and on-the-job training.

Certain new employees or employees transferred from other sections within the facility may be partially or wholly qualified by reason of previous applicable training or experience. The extent of further training for these employees is determined by applicable regulations, performance in review sessions, comprehensive examinations, or other techniques designed to identify the employee's present level of ability.

11.8 Other QA Elements

The QA Program and its supporting manuals, procedures and instructions are applicable to items and activities designated as QA Level 1, 1 Graded, QA Level 1-Fire Protection (QL-1F), 2AC, and 2.

The ~~Vice President~~Director of Compliance~~/General Counsel~~ is responsible for developing and revising the QA Program and assuring it is in compliance with applicable regulations, codes and standards. LBDCR-11-0031

The QA Program specifies mandatory requirements for performing activities affecting quality and is set forth in procedures which are distributed on a controlled basis to organizations and individuals responsible for quality. Revisions to these procedures are also distributed on a controlled basis. Applicable portions of the QA Program are documented, approved and implemented prior to undertaking an activity.

A management assessment of the QA program is performed at least six months prior to scheduled receipt of licensed material on the site. Items identified as needing completion or modification are entered into the CAP and corrective action completed before scheduled receipt of licensed material. LES Management monitors the QA program prior to this initial management assessment through project review meetings and annual assessments. This management assessment along with integrated schedules and program review meetings ensure that the QA program is in place and effective prior to receiving licensed material.

The LES QA program for design, construction, and preoperational testing continues simultaneously with the QA program for the operational phase while construction activities are in progress.

Anyone may propose changes to the QA Program supporting manuals and procedures. When reviewed by the ~~Vice President~~Director of Compliance~~/General Counsel~~ and found acceptable and compatible with applicable requirements, guidelines and LES policy, the changes may be implemented. The QA Program and supporting manuals and procedures are reviewed periodically to ensure they are in compliance with applicable regulations, codes, and standards. New or revised regulations, codes, and standards are reviewed for incorporation into the QA Program and supporting manuals and procedures as necessary. LBDCR-11-0031

Personnel performing activities covered by the QA program shall perform work in accordance with approved procedures, and must demonstrate suitable proficiency in their assigned tasks. Formal training programs are established for quality assurance policies, requirements, procedures, and methods. Ongoing training is provided to ensure continuing proficiency as procedural requirements change. New employees are required to attend a QA indoctrination class on authority, organization, policies, manuals, and procedures.

Additional formal training is conducted in specific topics such as NRC regulations and guidance, procedures, auditing, and applicable codes and standards. Supplemental training is performed as required. On-the-job training is performed by the employee's supervisor in QA area-specific procedures and requirements. Training records are maintained for each person performing quality-related job functions.

11.8 Other QA Elements

The Vice President - Operations and Chief Nuclear Officer and President assesses the scope, status, adequacy and regulatory compliance of the QA Program through regular meetings and correspondence with the ~~Vice President~~Director of Compliance~~/General Counsel~~ and the LES QA organization. Additionally, LES QA, through the ~~Vice President~~Director of Compliance~~/General Counsel~~, periodically informs the LES Plant Manager or President of quality concerns that need management resolution. LBDCR-11-0031

LES participates in the planning and scheduling for system turnover as construction is completed. Prior to system turnover, written procedures are developed for control of the transfer of systems, structures, components and associated documentation. The procedures include checklists, marked drawings, documentation lists, system status, and receipt control.

Major work activities contracted by LES shall be identified and controlled. Principal contractors shall be required to comply with the applicable portions of 10 CFR 50, Appendix B (CFR, 2003b), as determined by LES. The performance of contracted activities shall be formally evaluated by LES commensurate with the importance of the activities to safety.

Facility components and processes are assigned a QA level based on their safety significance. Each component will receive a classification of QA Level 1, QA Level 1 Graded, QA Level 1-Fire Protection (QL-1F), QA Level 2AC, QA Level 2, or QA Level 3 that applies throughout the life of the facility and is based on the following definitions:

QA Level 1 Requirements

The QA Level 1 Program shall conform to the criteria established in 10 CFR 50, Appendix B (CFR, 2003b). These criteria shall be met by commitments to follow the guidelines of ASME NQA-1 as specified in the QA Program Description. The QA Level 1 QA program shall be applied to those structures, systems, components, and administrative controls that have been determined to be IROFS (except IROFS27e to which QA Level 1 Graded and fire protection features designated as IROFS to which QL-1F applies), items that are essential to the functions of the IROFS, and items required to satisfy regulatory requirements for which QA Level 1 requirements are applied.

QA Level 1 Graded Requirements

The QA Level 1 Graded QA Program applies exclusively to IROFS27e structures. IROFS27e structures are structures whose failure has been analyzed to result in consequences that exceed the 10 CFR 70.61 performance requirements. The QA Level 1 Graded program is applied to design, procurement, construction and other activities as described in Section 21 of the QAPD. The QA Level 1 Graded Program applies to:

- Separation Building Modules (SBMs) with the exception of slab on grade or supports for internally housed QA Level 1 IROFS that are required to perform a safety function for a seismic event.
- Cylinder Receipt and Dispatch Building (CRDB) superstructure with the exception of the Bunkered Area structure which is designated QL-1. The non-bunkered area foundation is designated QL-1G; slab on grade is designated QL-3.

QA Level 1-Fire Protection (QL-1F Requirements)

12.0 PHASED OPERATION

The continued startup of the National Enrichment Facility does not include all facilities, systems, processes, and IROFS described in ISA Summary § 3.3 through § 3.8. The startup of the facility is performed in a phased approach to begin operation as soon as the required facilities, systems, processes, and IROFS are operational to support Initial Plant Operation (IPO). As delineated in SAR § 2.1.4, Transition from Design and Construction to Operations, LES is responsible for the design, quality assurance, construction, testing, initial startup, and operation of the facility. As the construction of systems is completed, or is nearing completion, the systems are turned over from construction organization (Projects) responsibility to operations organization responsibility. The turnover is documented by memoranda clearly stating the scope of the turnover, listing any identified deficiencies associated with the system, and clearly describing the operational and safety state and status of the system.

The facility will operate in a series of phases determined by operational requirements. IPO phase included all safety systems necessary to safely conduct enrichment operations.

An Operate While Constructing program is necessary to implement controls for continued construction during facility operation. The Operate While Constructing program is necessary until all cascades and expansion modifications are implemented and accepted by Operations.

Operate While Constructing is a process that implements controls to ensure that the Integrated Safety Analysis for the National Enrichment Facility remains valid during operations when part of the facility is still being constructed. The process of Phased Operation, placing cascades on-line and facility expansion is estimated to take several years; therefore, Operate While Constructing is an essential safety process for the operation of the National Enrichment Facility.

The following sections provide a description of the items that will become operational during the different phases of production ~~operations that differ between final operation of the facility and the interim operation for the Phased Operation approach~~. Applicable portions of SAR Chapter 12 are referenced by all other LBDs impacted by the Phased Operation approach. LBDCR-11-0038

The following general Accident Sequences and associated IROFS are applicable to all areas containing UF_6. ~~Because the CRDB is not operational and contains no UF_6, these accident sequences are not applicable to any room in the CRDB:~~ LBDCR-11-0038

General Accident Sequences	
• EE-SEISMIC-WORKER EVAC	IROFS39a
• FF-WORKER EVAC	IROFS36a, 36d, & 36i, IROFS39b
• EE-CHEM RELEASE-WORKER EVAC	IROFS39c
• EE-TORNADO MISSILE-SBM-CRDB SHELL & BUNKER WORKER	IROFS39d

12.2 Production Phases 1a

Description of Phase 1a will include only those items that will become applicable during Phase 1a.

Functions supporting cascade operation for Assay 1001 are available in addition to the UBC Storage Pad and Basin. Additional cascades and support equipment are added to increase production, but the plant is fully capable of carrying out continuous commercial production from Assay 1001. LBDCR-11-0038

12.2.5 Separations Building Modules (SBM)

12.2.5.1 Process Services Corridor (PSC)

The SBMs are as described in ISA Summary § 3.3.1.1 except the Process Services Corridor (PSC) for SBM-1001. Assay 1001 will be operational (ISA Summary § 3.3.1.1.2.2), but lacking gas transport equipment for cascades that are not on line (NaF Traps, Pump and Trap Sets, process headers, etc). This equipment is installed and operated as additional cascades are completed.

Accident Sequence EE-SEISMIC-SBM and associated IROFS27e and IROFS41are applicable to the SBM.

12.2.5.2 Cascade System

Assay 1001 Cascade System is operational as described in ISA Summary § 3.4.3 with the exception that not all individual cascades are operable. Cascade modules are brought online incrementally when the centrifuges within each cascade and all support equipment related to each cascade module are commissioned. Cascade modules 1 through 6 may be operating at the beginning of Production Phase 1a.

Accident sequence EE-SEISMIC-SBM and associated IROFS41 is applicable for Assay 1001.

12.2.5.3 Contingency Dump System

Assay 1001 Contingency Dump System is operational as described in ISA Summary § 3.4.8 for each operating Cascade Module. Each operating cascade module has its own dedicated Contingency Dump System available for use. As additional cascades are completed, additional contingency dump components are installed and made operational in the process services corridor to support incremental plant start up and expansion. LBDCR-11-0038

There is no accident sequence or IROFS directly associated with the Contingency Dump System.

12.2.5.4 UF_6 Feed System

Assay 1001 UF_6 Feed and Feed Purification Systems are operational as described in ISA Summary § 3.4.2 except a minimum of three (3) Solid Feed Stations (SFS) and one (1) Feed Purification Low temperature Take-off Station (LTTS) are required to be operable for FCOL enrichment operations. As construction progresses, additional stations are completed and

brought online as needed to support the incremental start up of cascades. The second Feed Purification Station (if operable) and all operable SFS not in use for enrichment operations may contain a 48Y cylinder (Feed, empty or full Tails, or test weight). When additional storage locations become available, the stored cylinders may be transferred from the stations, however, continued storage in the stations is not prohibited. .

Accident sequences UF1-1, UF2-1, and associated IROFS4 and 5 are applicable for Assay 1001.

12.2.5.5 Product Take-off System

Assay 1001 Product Take-off System is operational as described in ISA Summary § 3.4.4 except a minimum of three (3) Product LTTS are required to be operable for FCOL enrichment operation. As construction progresses, additional Product LTTS are brought online as needed to support the incremental start up of cascades. All operable Product LTTS not in use for enrichment operations may contain an empty or full 30B cylinder or test weight. When additional storage locations become available, the stored cylinders may be transferred from the stations, however, continued storage in the stations is not prohibited. LBDCR-11-0038

Accident sequences PT2-1 and associated IROFS1 and IROFS2 are applicable for Assay 1001.

12.2.5.6 Tails Take-off System

Assay 1001 Tails Take-off System is operational as described in ISA Summary § 3.4.5 except a minimum of three (3) Tails LTTS are required to be operable for FCOL enrichment operations. As construction progresses, additional Tails LTTS are brought online as needed to support the incremental start up of cascades. All operational stations not in use for enrichment operations may contain a 48Y cylinder (Feed, empty or full Tails, or test weight). When additional storage locations become available, the stored cylinders may be transferred from the stations, however, continued storage in the stations is not prohibited. Once an in-service feed cylinder is emptied, it is switched with a full feed cylinder from a tails station. The empty feed cylinder is then used for normal tails take-off. This cylinder storage strategy will allow approximately 3 months of operation before additional cylinder storage space is required. LBDCR-11-0038

Accident sequence TT2-1 and associated IROFS1 and 2 are applicable for Assay 1001.

12.2.5.7 Product Blending System

The Product Blending System is not operational and is not needed for Production Phase 1a; however, the Blending Donor and Receiver Stations are operable for storage of full product cylinders.

Accident sequences PB1-1 and PB2-1 and associated IROFS1, 2, 4, and 5 are applicable.

12.2.5.8 Gaseous Effluent Vent Systems (GEVS)

The Gaseous Effluent Ventilation System (GEVS) is constructed as two separate systems, Pumped Extract GEVS and CRDB GEVS. Pumped Extract GEVS is permanently installed in the UF_6 Handling Area of SBM-1001 and is operational to support SBM-1001 operations. The local extract ductwork that is used in the SBM is temporarily connected to the Pumped Extract

GEVS. ~~Because of this temporary cross-connection, there are limitations to the local extract capability.~~ The minimum desired target velocity in the GEVS header cannot be maintained when local extract flexible hoses are in use while connected to Pumped Extract GEVS. However, this reduced velocity has been evaluated in CALC-M-00020 and has been shown to be acceptable based on the resulting worst case holdup conditions. Because Pumped Extract GEVS is a safe-by-design system, there is no criticality issue. With worst case holdup conditions assumed (i.e., the entire assumed 800 grams of uranium at 5% enrichment [~1.2 kg of UF_6] collected at a single point source) the resulting radiation dose rate is less than 0.05 mrem/hr. When spread out over the entire length of GEVS piping, the radiation dose due to GEVS holdup is negligible. The following measures are in place to ensure adequate flow is provided at each local extract station: LBDCR-11-0028

- Configuration control is maintained by the Shift Manager and the use of caution tags on the local extract flexible hose station isolation valves. LBDCR-11-0038

All GEVS accident sequences (CL3-1, CL3-2, CL3-3, VR1-1, VR1-2, and VR 2-2) and associated IROFS (IROFS20, 21, 24a, 24b, are for CRDB operations and therefore not applicable to Production Phase 1a.

Accident sequence LOSS OF SAFE-BY-DESIGN ATTRIBUTE is applicable for the pumped Extract GEVS.

There is no accident sequence or IROFS directly associated with the local extract function of the CRDB GEVS.

12.2.6 Central Utilities Building (CUB)

12.2.6.1 Centrifuge Cooling Water System (CCWS)

The Centrifuge Cooling Water (CCW) System is operational with the exception of the cooling water towers. The cooling water towers are bypassed until ready for operation. Heat removal is performed by the CCW heat exchanger cooled by the CCW chiller units. This arrangement supports all operable cascades for Production Phase 1a.

There is no accident sequence or IROFS directly associated with CCWS.

12.2.7 Uranium Byproduct Cylinder (UBC) Storage Pad LBDCR-11-0038

The UBC Storage Pad and UBC Basin are not fully operational as described in ISA Summary § 3.3.1.6. The UBC Pad is being constructed in sections and expanded as required to accept additional cylinder storage. The UBC Pad Stormwater Retention Basin is a 2 section basin. Initially, only the west section will be built. However, the west side of the UBC Pad Stormwater Retention Basin contains sufficient capacity for the entire UBC Pad as currently designed. Additional cylinder storage areas are discussed in Section 12.2.4.4, Storage and applicable station sections.

Although the UBC Storage Pad is not fully built out, it is in use. Accident sequences FF42-1, FF43-1, FF43-2, and FF44-1 and associated IROFS36c, 36e, 36f, and 36g are applicable.

There is no accident sequence directly associated with the UBC Basin.

12.2.8 Material Handling Processes

The material handling processes defined below are in practice until the CRDB is operational with regards to the shipping and receiving of cylinders and the handling and storage of cylinders.

12.2.8.1 Cylinder Receipt and Shipping

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Until the CRDB becomes available, cylinders are shipped, received, and transferred via a Vehicle Loading and Unloading Area on the west side of the UF_6 Handling Area of SBM-1001. The Vehicle Loading and Unloading Area provide space for the following services:

- Cylinder loading and unloading
- Preparation for overpack/protective structural packaging.

The cylinders are received, shipped, and transferred to and from the UF_6 Handling Area at the Vehicle Loading and Unloading Area until the CRDB and becomes operational.

12.2.8.2 Description

Commercial transport tractors are disconnected from the trailers carry containers and connected to LES yard tractors which comply with IROFS36c (diesel fuel capacity less than 280 L (74 gal)). The yard tractor delivers UF_6 cylinders (i.e., full 48Y feed cylinders, and new or cleaned 30B product cylinders) to the Vehicle Loading and Unloading Area on the west side, south end of SBM-1001. Cylinders are unloaded with a gantry crane. The gantry crane lifts and transfers the cylinder to the rail transporter that sits on rails that are extended outside the SBM into the Vehicle Loading and Unloading Area. Upon completion of receipt inspection, the rail transporter moves the cylinder inside the UF_6 Handling Area. Cylinders are removed from the facility in the same fashion.

12.2.8.3 Equipment

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The following equipment is used for cylinder handling on the West side SBM-1001 receipt platform.

A. Vehicle Loading and Unloading Area

The Vehicle Loading and Unloading Area is located adjacent to the west side SBM-1001 equipment hatch. This provides a safe method of transfer from the vehicle trailer to rail transporter located on the platform.

Accident sequence FF7-1 and associated IROFS36c is applicable to the LES yard tractor at the Vehicle Loading and Unloading Area.

B. Gantry Crane

A dedicated gantry crane is used to handle cylinders on the vehicle loading and unloading area. The crane spans the width of the loading platform to access vehicle trailers and the rail transporter. The hoist has a maximum lift of approximately 6.1 m (20 ft). Crane specifications are as follows:

- Span 11.3 m (37 ft)

- Capacity — 20 MT (44,100 lb)
- Hoist lift height — 3.1 m (20 ft)
- Hoist lift speed — 3 m/min & 0.5 m/min (10 ft/min & 1.6 ft/min)
- Travel length — 7.9 m (26 ft)
- Bridge travel speed (VFD) — 19.8 m/min (65 ft/min)
- Brake type — Direct Current Disk

There is no accident sequence or IROFS directly associated with the gantry crane. LBDCR-11-0038

C. Scale

Inventory Weighing is performed using a temporary scale in the UF_6 Handling Area of SBM-1001. The scale is identical to the scales described in ISA Summary § 3.4.11.1.2 C. Each cylinder that enters or exits the UF_6 Handling Area is weighed. A weigh scale capable of weighing a load of 17 MT (37,500 lb) and capable of accepting a load of 20 MT (44,100 lb) is installed. The scale is capable of weighing to a tolerance of ±2.5 kg (±5.5 lb). The scale has reader and printout facilities.

There is no accident sequence or IROFS directly associated with the weigh scales.

D. Powered Vehicles and Rail Transporters

LES yard tractors that comply with IROFS36c (diesel fuel capacity less than 280 L) are utilized to deliver the vehicle trailer containing cylinders to the Vehicle Loading and Unloading Area. The gantry crane lifts and transfers the cylinder to the rail transporter that sits on rails extended outside the SBM into the Vehicle Loading and Unloading Area. On completion of receipt inspection, the rail transporter retrieves the cylinder for use. Cylinders are removed from the facility in the same fashion.

Accident sequence FF7-1 and associated IROFS36c is applicable to the LES yard tractors at the Vehicle Loading and Unloading Area. LBDCR-11-0038

There is no accident sequence or IROFS directly associated with the Rail Transporter.

12.2.8.4 Storage

A. All available operable feed, feed purification, and tails, stations that are not in operation for enrichment can be used for 48Y cylinder storage (Feed, empty or full Tails, or test weight). All Product and Blending System Stations not in use for enrichment operations can be used for 30B cylinder storage.

B. A switch process is used to maximize storage in the stations during phased operations. When a product cylinder is filled, the process will shift to the standby product station. The full product cylinder may be switched with an empty product cylinder being stored in a Blending System Donor or Receiver Station. The full product cylinder will be stored in the now empty Blending System Donor or Receiver station that previously contained the empty product cylinder. When available Blending System Donor or Receiver stations may contain full product cylinders, additional filled product cylinders will simply remain in their respective Product LTTS for storage. This switching process is also used for feed and tails cylinders. As the feed cylinder empties, the process will shift to the standby feed station. The empty feed cylinder is then switched with a full feed cylinder from a Tails or Feed Purification LTTS.

Additional product cylinders may be stored in UX30 overpacks and places in approved areas within the UF6 Handling Area using a pallet jack. The empty feed cylinder is installed into the now empty Tails or Feed Purification LTTS that previously contained the full feed cylinder. This switching of cylinders will allow approximately 3 months of operation before additional storage space is required.

C. In the event that additional storage is required, filled tails cylinders may be shipped off-site to a licensed facility. When additional storage capabilities are established, these cylinders may be shipped back to the site.

Accident sequences UF1-1, UF2-1, PT2-1, TT2-1, PB1-1, PB2-1, PB2-2, and CP1-2 and associated IROFS1, 2, 4, 5, and 16a are applicable.

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12.2.9 Safety Significance

Section 12.0 of the Safety Analysis Report has been initially established as an administrative change to describe the Phased Operation concept. There is no safety significance because none of the identified changes will be finalized and implemented until reviewed and approved in accordance with the LES configuration management program as described in § 11.1, Management Measures. Pursuant to 10 CFR 70.72, LES has established a system to evaluate, implement, and track each change to the site, structures, processes, systems, equipment, components, computer programs, and activities of personnel. Configuration management of IROFS, and any items that may affect the function of IROFS, is applied to all items identified within the scope of the IROFS boundary. All changes to structures, systems, equipment, components, and activities of personnel within the identified IROFS boundary are evaluated before the change is implemented. If the change requires an amendment to the License, Nuclear Regulatory Commission approval is received prior to implementation.

All proposed changes described in Section 12.0 are tracked and evaluated per the LES configuration management program prior to implementation. As the changes are processed, Section 12.0 will be revised to incorporate changes to the facility, processes, and programs. Section 12.0 documents all site changes facilitated as a result of the Phased Operation approach.

12.3 Production Phase 1b

Description of Phase 1b will include only those items that will become applicable during Phase 1b.

Functions supporting cascade operation for Assay 1001 and 1002 are available. The Liquid Sampling System, Centrifuge Cooling Water System (CCWS), Assay 1002 UF_6 Area and PSC are operable in this phase of operation. Additional cascades and support equipment are added to Assay 1001 and Assay 1002 to increase production, but the plant is fully capable of carrying out continuous commercial production.

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12.3.1 Separations Building Modules

12.3.1.1 Process Services Corridor (PSC)

The SBM is as described in ISA Summary § 3.3.1.1 except the Process Services Corridor (PSC) for Assay 1002. Assay 1002 will be operational (ISA Summary § 3.3.1.1.2.2), but lacking gas transport equipment for cascades that are not on line (NaF Traps, Pump and Trap Sets, process headers, etc). This equipment is installed and operated as additional cascades are completed.

Accident Sequence EE-SEISMIC-SBM and associated IROFS27e and IROFS41are applicable to the SBM.

12.3.1.2 Cascade System

Assay 1002 Cascade System is operational as described in ISA Summary § 3.4.3 with the exception that not all individual cascades are operable. Cascade modules are brought online incrementally when the centrifuges within each cascade and all support equipment related to each cascade module are commissioned. Cascade modules 1 through 6 may be operating at the beginning of Production Phase 1a.

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Accident sequence EE-SEISMIC-SBM and associated IROFS41 is applicable for Assay 1002.

12.3.1.3 Contingency Dump System

Assay 1002 Contingency Dump System is operational as described in ISA Summary § 3.4.8 for each operating Cascade Module. Each operating cascade module has its own dedicated Contingency Dump System available for use. As additional cascades are completed, additional contingency dump components are installed and made operational in the process services corridor to support incremental plant start up and expansion.

There is no accident sequence or IROFS directly associated with the Contingency Dump System.

12.3.1.4 UF_6 Feed System

Assay 1001 UF_6 Feed and Feed Purification Systems are operational as described in ISA Summary § 3.4.2 with the exception of potentially one (1) Feed Station not installed. Assay 1002 UF_6 Feed and Feed Purification Systems are operational as described in ISA Summary § 3.4.2 except a minimum of three (3) Feed Stations and one (1) Feed Purification Low Temperature Take-Off Station (LTTS) are required to be operable for Assay 1002 FCOL

enrichment operations. As construction progresses, additional stations are completed and brought online as needed to support the incremental start up of cascades. The second Feed Purification Station (if operable) and all operable SFS not in use for enrichment operations may contain a 48Y cylinder (Feed, empty or full Tails, or test weight). When additional storage locations become available, the stored cylinders may be transferred from the stations, however, continued storage in the stations is not prohibited.

Accident sequences UF1-1, UF2-1, and associated IROFS4 and 5 are applicable in Assay 1001 and 1002.

12.3.1.5 Product Take-off System

Assay 1001 Product Take-off System is operational as described in ISA Summary § 3.4.4. Assay 1002 Product Take-Off System is operational as described in ISA Summary 3.4.4 except a minimum of three (3) Product LTTS are required to be operable for Assay 1002 FCOL enrichment operation. As construction progresses, additional Product LTTS are brought online as needed to support the incremental start up of cascades. All operable Product LTTS not in use for enrichment operations may contain an empty or full 30B cylinder or test weight. When additional storage locations become available, the stored cylinders may be transferred from the stations, however, continued storage in the stations is not prohibited. LBDCR-11-0038

Accident sequences PT2-1 and associated IROFS1 and IROFS2 are applicable for Assay 1001 and 1002.

12.3.1.6 Tails Take-off System

Assay 1001 Tails Take-off System is operational as described in ISA Summary § 3.4.5. Assay 1002 Tails Take-Off System is operational as described in ISA Summary 3.4.5 except a minimum of three (3) Tails LTTS are required to be operable for Assay 1002 FCOL enrichment operations. As construction progresses, additional Tails LTTS are brought online as needed to support the incremental start up of cascades. All operational stations not in use for enrichment operations may contain a 48Y cylinder (Feed, empty or full Tails, or test weight). When additional storage locations become available, the stored cylinders may be transferred from the stations, however, continued storage in the stations is not prohibited. Once an in-service feed cylinder is emptied, it is switched with a full feed cylinder from a tails station. The empty feed cylinder is then used for normal tails take-off. This cylinder storage strategy will allow approximately 3 months of operation before additional cylinder storage space is required. LBDCR-11-0038

Accident sequence TT2-1 and associated IROFS1 and 2 are applicable for Assay 1001 and 1002.

12.3.1.7 Product Liquid Sampling System

The Product Liquid Sampling System autoclaves are available as described in the ISA Summary 3.4.7 for Production Phase 1b. A storage location for sample containers containing UF_6 will be located in the UF_6 Handling Area and/or Mass Spec Room. LBDCR-11-0051

Accident sequences PB2-6, PB3-3, PB4-1, PB4-2, PB4-3, PB4-4, EE-TORNADO MISSILE-SBM PUBLIC, and EE-SEISMIC-SBM and associated IROFS3, 10, 11, 12, 28, 30a/b/c, 42 and 47a are applicable.

12.3.2 Central Utilities Building (CUB)

12.3.2.1 Centrifuge Cooling Water System (CCWS)

The Centrifuge Cooling Water (CCW) System is operational with the cooling water towers in use. Heat removal is supplemented by the CCW heat exchanger cooled by the CCW chiller units. This arrangement supports all operable cascades for Production Phase 1b.

LBDCR-11-0038

There is no accident sequence or IROFS directly associated with CCWS.

12.4 Production Phase 2a

Description of Phase 2a will include only those items that will become applicable during Phase 2a.

Functions supporting cascade operation for Assay 1001 and 1002 are available. The CRDB Cylinder Receipt and Shipping and Cylinder Handling and Storage are operable in this phase of operation. Additional cascades and support equipment are added to Assay 1001 and Assay 1002 to increase production, but the plant is fully capable of carrying out continuous commercial production.

12.4.1 Cylinder Receipt and Dispatch Building (CRDB)

The CRDB shell will be available as described in the ISA Summary 3.4.11.1.1. CRDB is available for Cylinder Receipt and Shipping, Handling and Storage. Cylinder Testing is not operational. LBDCR-11-0038

Accident Sequences EE-LP-SBM-CRDB-SHELL, EE-SNOW-SBM-CRDB-SHELL, EE-TORNADO&HIGH WIND-SBM-CRDB-SHELL, EE-TORNADO MISSILE-SBM-CRDB-SHELL&BUNKER WORKER, EE-SEISMIC-CRDB-SBM-SHELL, EE-SEISMIC-WORKER-EVAC, FF-WORKER EVAC, CHEM RELEASE- WORKER EVAC, FF6-1, FF6-2, FF7-1, FF42-1, IROFS27e, 35, 36a, 36c, 39a, 39b, 39c and 39d.

12.4.1.1 Vehicle Loading Area

The Vehicle Loading Area is operational for cylinder handling as described in the ISA Summary 3.4.11.1.2.A.

Accident Sequence RD-1-1, IROFS 45 are applicable

12.4.1.2 Double Girder Bridge Cranes

The Double Girder Bridge Cranes are operational for cylinder handling as described in the ISA Summary 3.4.11.1.2.B.

Accident Sequence RD-1-1 and IROFS45 are applicable.

12.4.1.3 Scales

Inventory Weighing is performed in the CRDB as described in the ISA Summary 3.4.11.1.1.c. The temporary scale located in SBM-1001 is no longer required, but still may be used if installed. LBDCR-11-0038

There is no accident sequence or IROFS directly associated with the weigh scales.

12.4.1.4 Powered Vehicles and Rail Transporters

Powered Vehicles and Rail Transporters are operational as described in ISA Summary 3.4.11.1.2.D.

There is no accident sequence or IROFS directly associated with Rail Transporter.

12.4.1.5 Storage

The CRDB will be available for cylinder storage as described in ISA Summary 3.4.11.1.1. This will not prohibit storage in available stations with operational and applicable IROFS.

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Accident Sequence RD-1-1 and IROFS45 are applicable.

12.5 Production Phase 2b

Description of Phase 2b will include only those items that will become applicable during Phase 2b.

Functions supporting bunkered CRDB operations are operable during this phase of operation.

12.5.1 Cylinder Receipt and Dispatch Building (CRDB)

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During this phase of operation, the CRDB bunkered area is operational.

Accident sequences EE-LP-CRDB-BUNKER(T), EE-LP-CRDB-BUNKER(CR), EE-SNOW-CRDB-BUNKER, EE-TORNADO, TORNADO MISSILE,&HIGH WIND-CRDB-BUNKER, EE-TORNADO-SBM-CRDB-SHELL&BUNKER WORKER, EE-SEISMIC-CRDB-BUNKER, FF6-1, FF6-2, IROFS27a/b/c, 36d, 39b and 39d.

12.5.1.1 Ventilated Room

The Ventilated Room is operational as described in the ISA Summary 3.5.17.

Accident Sequences PB2-6, VR1-1, VR1-2, VR1-3, VR1-5, VR2-1, VR2-2, VR2-7, IROFS3, 21, 22, 23a, 23b, 24a, 30a/b/c, 31a/b/c, and 47b are applicable.

12.5.1.2 Solid Waste Storage

The Solid Waste Storage facility will be operational as described in the ISA Summary 3.5.13.

Accident Sequences SW1-1, SW1-2 and IROFS14a and 14b are applicable.

12.5.1.3 Decontamination Workshop

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The Decontamination Workshop will be operational as described in the ISA Summary 3.5.14 with the exception of the large decontamination train. The Decontamination workshop will have the ability to decontaminate small items via the small decontamination train. The capability to decontaminate larger items such as pumps will be conducted in a later phase of operation.

Accident Sequences DS1-1, DS1-2, DS1-3, DS2-1, DS2-2, DS2-3, DS3-1, DS3-2, PT3-5, IROFS14a, 14b, 15, 19a, 19c, and 19d are applicable.

12.5.1.4 Chemistry Laboratory

The Chemistry Laboratory will be operational as described in the ISA Summary 3.5.18. This includes the operation of the Sub-Sampling System.

Accident Sequences CL3-1, CL3-2, CL3-3, IROFS20, 21, 24b, 43 and 46 are applicable.

12.5.1.5 Gaseous Effluent Vent System (GEVS)

The Gaseous Effluent Ventilation System (GEVS) is constructed as two separate systems, Pumped Extract GEVS and CRDB GEVS. Pumped Extract GEVS is permanently installed in the UF_6 Handling Area of SBM-1001 and is operational to support SBM-1001 operations. The

local extract ductwork that is used in the SBM is temporarily connected to the Pumped Extract GEVS. Because of this temporary cross-connection, there are limitations to the local extract capability. The following measures are in place to ensure adequate flow is provided at each local extract station:

- Configuration control is maintained by the Shift Manager and the use of caution tags on the local extract flexible hose station isolation valves.

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Accident Sequences CL3-1, CL3-2, CL3-3, VR1-1, VR1-2, and VR 2-2 and associated IROFS20, 21, 24a, 24b, are applicable.

Accident sequence LOSS OF SAFE-BY-DESIGN ATTRIBUTE is applicable for the pumped Extract GEVS.

There is no accident sequence or IROFS directly associated with the local extract function of the CRDB GEVS.

12.6 Production Phase 2c

Description of Phase 2c will include only those items that will become applicable during Phase 2c.

Functions supporting the initial startup of the Liquid Effluent Collection and Treatment System to include the storage but not the treatment of liquid effluents will be operational during this phase.

12.6.1 Cylinder Receipt and Dispatch Building (CRDB))

12.6.1.1 Liquid Effluent Collection and Treatment System (LECTS)

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The Liquid Effluent Collection and Treatment System will be operational as described in the ISA Summary 3.5.12 with the exception of being able to treat liquid effluents. LECTS will be used for storage until the remainder of the system is installed.

Accident Sequences LW1-1, LW1-2, LW1-3, LW2-1, LW3-1, LW5-1, IROFS14a, 14b, 19a, 19c, 19d,

12.7 Phase 3

Description of Phase 3 will include only those items that will become applicable during Phase 3.

Functions of the Decontamination Workshop and Liquid Effluent Collection and Treatment System will be fully operational to include the decontamination of pumps and the treatment of liquid effluents respectively. In addition, the Product Blending System will be operational.

12.7.1 Separations Building Module (SBM)

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12.7.1.1 Product Blending System

The Product Blending System will be operational as described in the ISA Summary 3.4.6.

Accident Sequences PB1-1, PB2-1, PB2-2, PB2-4, IROFS1, 2, 4, 5, 16a and 38 are applicable.

12.7.2 Cylinder Receipt and Dispatch Building (CRDB)

12.7.2.1 Decontamination Workshop

The Decontamination Workshop will be fully operational as described in the ISA Summary 3.5.14. This will include the availability of the large decontamination train which has the ability to decontaminate large items such as pumps. In addition, this involves the operability of the PFPE Oil Recovery System.

Accident Sequences PT3-5, FR1-1, FR1-2, FR2-1, FR2-2, IROFS14a, 14b, and 15 are applicable.

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12.7.2.2 Liquid Effluent Collection and Treatment System (LECTS)

The LECTS will be operational as described in the ISA Summary 3.5.12. This includes not only the storage of liquid effluent but also the subsequent treatment.

Accident Sequences LW1-1, LW1-2, LW1-3, LW2-1, LW3-1, LW5-1, IROFS14a, 14b, 19a, 19c and 19d are applicable.

12.2Production Phases 1a and 1b

The difference between Production Phase 1a and Production Phase 1b is that the Product Blending and Liquid Sampling System in SBM-1001 will NOT be available in Production Phase 1a. This is identified in the text below by specifically indicating when the discussion is applicable to Production Phase 1a only (this applies to the Product and Liquid Sampling Sections 12.2.1.1.2, 12.2.1.1.3, 12.2.2.5, and 12.2.2.6.)

12.2.1Facility Differences for Production Phase 1a and 1b

12.2.1.1Separations Building Modules

LBDCR-11-0038

12.2.1.1.1Process Services Corridor (PCS)

The SBMs are as described in ISA Summary § 3.3.1.1 except the Process Services Corridor (PSC) for SBM-1001 will be operational (ISA Summary § 3.3.1.1.2.2), which lacks gas transport equipment for cascades that are not on line (NaF Traps, Pump and Trap Sets, process headers, etc). This equipment is installed and operated as additional cascades are completed.

Accident Sequence EE-SEISMIC-SBM and associated IROFS27e and IROFS41are applicable to the SBM.

12.2.1.1.2Blending System

The Blending Receiving and Donor Stations are not needed for Production Phase 1a. However, the Blending Donor and Receiver Stations are operable for storage of empty or full product cylinders.

Accident sequences PB1-1 and PB2-1 and associated IROFS1, 2, 4, and 5 are applicable .

12.2.1.1.3Product Liquid Sampling System

The Product Liquid Sampling System autoclaves are not available and not needed for Production Phase 1a. Without these components, product cylinders can not be shipped to customers but can be shipped off site for temporary storage.

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Because the autoclaves are not available, accident sequences PB4-1, PB4-2, PB4-3 ,PB4-4, EE-TORNADO MISSILE-SBM PUBLIC, and EE-SEISMIC-SBM and associated IROFS10, 11, 12, and 28 are not applicable. Note that the seismic events are applicable to the SBM but the autoclave contribution to the total release is not applicable.

12.2.1.1.4 Rail Transporter

The Rail Transporter travels on rails embedded in the floor of the UF_6 Handling Area. These rails run the entire width of the module; east to the CRDB and west through doors onto a concrete pad where cylinders are delivered. The rail transporter transfers 30B and 48Y cylinders to and from the appropriate feed, feed purification, tails, or blending stations, product sampling autoclaves, or the temporary scale in SBM-1001.

There is no accident sequence or IROFS directly associated with the Rail Transporter.

~~12.2.1.1.5Mobile Pressure Transducer Calibration Rig~~

~~The pressure transducer calibration rig is limited to use in non UF_6 contaminated systems. Initial calibrations of pressure transducers on non UF_6 contaminated systems are performed prior to operations. If a pressure transducer fails there are installed backups that can be used.~~

~~Because the pressure transducer calibration rig is limited to use in non UF_6 contaminated systems, accident sequences MR3-1 and MR3-2 in addition to associated IROFSC21 are not applicable.~~

~~**12.2.1.2 Technical Services Building (TSB)**~~

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~~12.2.1.2.1 Medical Room~~

~~The Medical Room is operational for general first aid cases. Injuries requiring more than general first aid are transported off site to local area medical facilities.~~

~~There is no accident sequence or IROFS directly associated with the Medical Room.~~

~~12.2.1.2.2Break Room~~

~~The Break Room is not operational.~~

~~There is no accident sequence or IROFS directly associated with the Break Room.~~

~~12.2.1.2.3I&C Electrical Shop~~

~~The I&C Electrical Shop is not operational. The I&C Electrical Shop serves as a work area for general electrical and I&C components and maintenance. Maintenance on non-contaminated equipment is delayed until the I&C Electrical Shop is available or is conducted in other locations on-site or off-site, as necessary, based on the equipment and maintenance required.~~

~~There is no accident sequence or IROFS directly associated with the I&C Electrical Shop.~~

~~12.2.1.2.4Mechanical Shop~~

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~~The Mechanical Shop is not operational. The Mechanical Shop serves as a work area for general mechanical maintenance and work such as painting or welding. Maintenance on non-contaminated equipment is delayed until the Mechanical Shop is available or conducted in other locations on-site or off-site, as necessary, based on the equipment and maintenance required.~~

~~There is no accident sequence or IROFS directly associated with the Mechanical Shop.~~

~~12.2.1.2.5Waste Processing Room~~

~~The Waste Processing Room is not operational. The Waste Processing Room serves as a handling area for non-radioactive waste. Non-radioactive waste is either stored under appropriate safety controls until handling systems are available, or shipped off-site to a processing facility for treatment and/or disposal at a licensed facility.~~

~~There is no accident sequence or IROFS directly associated with the Waste Processing Room.~~

~~12.2.1.2.6Environmental Monitoring Laboratory~~

~~The Environmental Monitoring Laboratory is not operational. Instead, samples are collected and shipped to a certified testing facility for analysis. The sample containers are not returned to LES, but are disposed of by the receiving facility.~~

~~There is no accident sequence or IROFS directly associated with the Environmental Monitoring Laboratory~~

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~~**12.2.1.3Cylinder Receipt and Dispatch Building (CRDB)**~~

~~12.2.1.3.1Solid Waste Collection Room~~

~~The Solid Waste Collection Room is not operational. The Solid Waste Collection Room is designed to package both wet and dry low-level radioactive solid waste.~~

~~The small quantity of solid waste that is expected to be generated prior to the Solid Waste Collection Room becoming operational is placed in a lined 55 gal drum with <300 g ^{235}U as determined through bookkeeping. Once the drums have been filled they are sealed with a tamper-indicating device (TID) and placed into the Material Control and Accountability (MC&A) item control program. Up to four drums are stored in the Ventilated Storage Room in the UF_6 Handling Area in SBM-1001. A qualified contracted company conducts non-destructive assay (NDA) on the drums to determine the final ^{235}U content. Once the assay is complete Radiation Protection and MC&A Departments can release the drums from the MC&A item control inventory to radioactive material storage areas (RMAs) external to the SBM. The drums will remain in storage until either further evaluation by radiation protection free releases the material or sufficient quantity is accumulated to prepare an offsite shipment. Because the Solid Waste Collection Room is not completed, accident sequences SW1-1 and SW1-2 and associated IROFS14a and IROFS 14b are not applicable to this room.~~

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~~Transitional accident sequences TVR1-1, TVR1-2, and TVR1-3 have been identified that require implementation of existing IROFS14a and 14b, and IROFS31a, 31b, and 31c to the Ventilated Storage Room. See ISA Summary Tables 4.1-4, Transitional Accident Sequence and Risk Index, and 4.1-5, Transitional Accident Sequence Descriptions.~~

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~~12.2.1.3.2Vacuum Pump Rebuild Workshop~~

~~The Vacuum Pump Rebuild Workshop is not operational. Rebuilding vacuum pumps is a planned evolution. In the unlikely event that a rebuild of a vacuum pump containing UF_6 is required, the pump is replaced with a clean vacuum pump and the contaminated pump stored in accordance with appropriate radiological controls until the Vacuum Pump Rebuild Workshop is completed.~~

~~There is no accident sequence or IROFS directly associated with the Vacuum Pump Rebuild Workshop.~~

~~12.2.1.3.3Decontamination Workshop~~

~~The Decontamination Workshop is not operational. The decontamination systems in this workshop are designed for radioactive decontamination of materials and equipment used in uranium hexafluoride systems, waste handling systems, and other areas of the plant. The small quantity of contaminated equipment that is expected is stored in accordance with appropriate chemical, radiological, and criticality safety controls until the Decontamination Workshop is completed or shipped off site to a processing facility for treatment and/or disposal at a licensed facility.~~ LBDCR-11-0038

~~Equipment, other than pumps, requiring radioactive decontamination is placed in a lined 55 gal drum with <300 g ^{235}U as determined through bookkeeping. Once the drums have been filled they are sealed with a tamper-indicating device (TID) and placed into the Material Control and Accountability (MC&A) item control program. Up to four drums are stored in the Ventilated Storage Room in the UF_6 Handling Area in SBM-1001. A qualified contracted company conducts non-destructive assay (NDA) on the drums to determine the final ^{235}U content. Once the assay is complete Radiation Protection and MC&A Departments can release the drums from the MC&A item control inventory to radioactive material storage area (RMAs) external to the SBM. The drums will remain in storage until either further evaluation by radiation protection free releases the material or sufficient quantity is accumulated to prepare an offsite shipment.~~ LBDCR-11-0027

~~Pumps requiring decontamination will be stored in place until the decontamination workshop is completed and running.~~

~~Because the Decontamination Workshop is not completed, accident sequence LOSS OF SAFE-BY-DESIGN ATTRIBUTE is not applicable to this room.~~

~~12.2.1.3.4Ventilated Room~~ LBDCR-11-0038

~~The Ventilated Room is not operational. The main activities carried out in the Ventilated Room are servicing chemical traps by removing spent carbon, aluminum oxide, and sodium fluoride and replacing damaged and leaking valves on cylinders which contain UF_6. Servicing chemical traps is a planned evolution and is not required or planned before Ventilated Room is completed.~~

~~Because the Ventilated Room is not available, accident sequences VR1-1, VR1-2, VR1-3, VR1-5, VR2-1, VR2-2, VR2-7, FF24-1, FF25-1, and FF25-2 and associated IROFS3, 21, 23a, 23b, 24a, 35, 36d, 37, 47b and accident sequence LOSS OF SAFE-BY-DESIGN ATTRIBUTE are not applicable for the Ventilated Room.~~ LBDCR-11-0027

~~12.2.1.3.5Reserved~~

~~12.2.1.3.6Contaminated Material Handling Room~~

~~The Contaminated Material Handling Room is not operational. Instead, contaminated disposable protective clothing is collected, monitored and either shipped off site to a licensed disposal facility or stored on site in accordance with appropriate controls until the Contaminated Material Handling Room and Solid Waste Collection Room are completed and implemented.~~

~~Radioactive waste is placed in a lined 55 gal drum with < 300 g ^{235}U as determined through bookkeeping. Once the drums have been filled they are sealed with a tamper-indicating device (TID) and placed into the Material Control and Accountability (MC&A) item control program. Up to four drums are stored in the Ventilated Storage Room in the UF_6 Handling Area in SBM-1001. A qualified contracted company conducts non-destructive assay (NDA) on the drums to determine the final ^{235}U content. Once the assay is complete Radiation Protection and MC&A Departments can release the drums from the MC&A item control inventory to radioactive material storage areas (RMAs) external to the SBM. The drums will remain in storage until either further evaluation by radiation protection free releases the material or sufficient quantity is accumulated to prepare an offsite shipment.~~ LBDCR-11-0027

~~Equipment, other than pumps, requiring radioactive decontamination is treated the same as radioactive waste (described above) except that it is stored until decontamination facilities are available on site. Pumps requiring decontamination will be stored in place until the decontamination workshop is completed and running.~~ LBDCR-11-0038

~~There is no accident sequence or IROFS directly associated with the Contaminated Material Handling Room.~~

~~12.2.1.3.7Gaseous Effluent Ventilation System (GEVS) Room~~

~~The Gaseous Effluent Ventilation System (GEVS) is constructed as two separate systems, Pumped Extract GEVS and CRDB GEVS. Pumped Extract GEVS is permanently installed in the UF_6 Handling Area of SBM-1001 and is operational. Because the CRDB is not operational, local extract ductwork is temporarily connected to the Pumped Extract GEVS in SBM-1001 to support operations there. All GEVS accident sequences (CL3-1, CL3-2, CL3-3, VR1-1, VR1-2, VR2-2, and FF25-2) and associated IROFS (IROFS20, 21, 24a, and 24b and 37) are for CRDB operations and therefore not applicable for this room.~~ LBDCR-11-0027

~~Accident sequence LOSS OF SAFE-BY-DESIGN ATTRIBUTE is applicable for the Pumped Extract GEVS.~~

~~There is no accident sequence or IROFS directly associated with the local extract function of the CRDB GEVS, but not applicable to CRDB GEVS.~~ LBDCR-11-0038

~~12.2.1.3.8Mass Spectrometry Laboratory~~

~~The Mass Spectrometry Laboratory is not operational. Instead, samples are collected and shipped to a certified testing facility for analysis.~~

~~Because the Mass Spectrometry Laboratory is not completed, accident sequence LOSS OF SAFE-BY-DESIGN ATTRIBUTE is not applicable to this room.~~

~~12.2.1.3.9Chemical Laboratory~~

~~The Chemical Laboratory is not operational. Instead, samples are collected and shipped to a certified testing facility for analysis. Contaminated sample containers are not returned to LES, but are disposed of by the facility.~~

~~Because the Chemical Laboratory is not completed, accident sequences CL3-1, CL3-2, and CL3-3 and associated IROFS24b, 43, and 46 and LOSS OF SAFE-BY-DESIGN ATTRIBUTE are not applicable to this room.~~

~~12.2.1.3.10Radiation Monitoring Laboratory~~

~~The Radiation Monitoring Laboratory is not operational. Instead, samples are collected and shipped to a certified testing facility for analysis.~~ LBDCR-11-0038

~~There is no accident sequence or IROFS directly associated with the Radiation Monitoring Laboratory.~~

~~12.2.1.3.11Truck Bay/Shipping and Receiving Area~~

~~Commercial transport tractors are disconnected from the trailers carrying containers and connected to LES yard tractors which comply with IROFS36c (i.e., diesel fuel capacity less than 280 L (74 gal)). The yard tractor delivers UF_6 cylinders to the Vehicle Loading and Unloading Area on the west side of SBM-1001 in the southwest corner.~~

~~Cylinders are unloaded with a gantry crane at the Vehicle Loading and Unloading Area of SBM-1001. The gantry crane lifts and transfers the cylinder to the rail transporter that sits on rails extended outside the SBM into the Vehicle Loading and Unloading Area. On completion of receipt inspection, the rail transporter will move the cylinder inside the UF_6 Handling Area. Cylinders are removed from the facility in the same fashion.~~

~~There is no accident sequence or IROFS directly associated with the Gantry Crane at the SBM Vehicle Loading and Unloading Area.~~

~~12.2.1.3.12Cylinder Storage Areas~~

- ~~Full feed cylinders may be stored in the UF_6 Handling Area in available Solid Feed, Feed Purification, and Tails Stations. When the UBC Storage Pad or the CRDB is ready to accept cylinders for storage the cylinders stored in the stations may be transferred, but continued storage in the stations is not prohibited.~~ LBDCR-11-0038

~~Accident sequences UF1-1, UF2-1, and TT2-1, and associated IROFS1, 2, 4, and 5 are applicable.~~

- ~~Full product cylinders can be stored in available Product Take-off Stations and Blending Donor and Take-off Stations. While product cylinders cannot be physically connected to Tails Stations, Feed Stations or Feed Purification Stations, they may be placed in these stations for storage purposes. When the CRDB is ready to accept cylinders for storage the cylinders stored in the stations may be transferred, but continued storage in the stations is not prohibited. However, it is preferable to ship the full product cylinders to clients.~~ LBDCR-11-0012 LBDCR-11-0007

~~Accident sequences PT2-1, PT2-2, PB1-1, PB2-1, PB2-2, and CP1-2 and associated IROFS1, 2, 4, 5, and 16a are applicable.~~

- ~~Full tails cylinders are stored in available Tails Take-off Stations. When the UBC Storage Pad or the CRDB is ready to accept cylinders for storage cylinders stored in the stations may be transferred, but continued storage in the stations is not prohibited.~~

~~Accident sequence TT2-1, and associated IROFS1 and 2 are applicable.~~

~~**12.2.1.4Uranium Byproduct Cylinder (UBC) Storage Pad**~~

~~The UBC Storage Pad and UBC Basin are not fully operational as described in ISA Summary § 3.3.1.6. The UBC Pad is being constructed in sections and expanded as required to accept additional cylinder storage. The UBC Pad Stormwater Retention Basin is a 2 section basin. Initially, only the west section will be built. However, the west side of the UBC Pad Stormwater Retention Basin contains sufficient capacity for the entire UBC Pad as currently designed. Additional cylinder storage areas are discussed in Sections 12.2.1.3.12, Cylinder Storage Areas and 12.2.2.9.4., Storage.~~

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~~Although the UBC Storage Pad is not fully built out, it is in use. Accident sequences FF42-1, FF43-1, FF43-2, and FF44-1 and associated IROFS36c, 36e, 36f, and 36g are applicable.~~

~~There is no accident sequence directly associated with the UBC Basin.~~

~~**12.2.1.5Central Utilities Building (CUB)**~~

~~The CUB is not fully operational as described in ISA Summary § 3.3.1.7. However, systems required for Production Phase 1a and 1b are ready in sufficient capacity to support plant operations. Systems within the CUB that are required to support Production Phases 1a and 1b are described in Section 12.2.4, Utility and Support System Differences for Production Phase 1a and 1b.~~

~~**12.2.1.6Administration Building**~~

~~The Administration Building is not operational. Until building completion, the staff will continue to be housed in temporary buildings on the east end of the facility. The Administration Building lobby is designed to act as an assembly area for emergency planning purposes. Alternate assembly areas are designated for assembly until completion for the Administration Building.~~

~~There is no accident sequence or IROFS directly associated with the Administration Building.~~

~~**12.2.1.7Site Security Buildings**~~

~~The main Security Building is operational for access to the Controlled Access Area (CAA). Vehicular traffic passes through additional security checkpoints before being allowed to park. Parking is located outside of the Controlled Access Area (CAA) security fence. Visitor passes are issued at a temporary security trailer located at the south east entrance to the facility.~~

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~~There is no accident sequence or IROFS directly associated with the Security Building~~

~~**12.2.2 Process Differences for Initial Production Phase 1a and 1b**~~

~~**12.2.2.1UF_6 Feed System**~~

~~The UF_6 Feed and Feed Purification Systems are operational as described in ISA Summary § 3.4.2 except a minimum of three (3) Solid Feed Stations (SFS) and one (1) Feed Purification Low temperature Take-off Station (LTTS) are required to be operable for FCOL enrichment operations. As construction progresses, additional stations are completed and brought online as needed to support the incremental start up of cascades. The second Feed Purification Station (if operable) and all operable SFS not in use for enrichment operations may contain a~~

48Y cylinder (Feed, empty or full Tails, or test weight). When additional storage locations become available, the stored cylinders may be transferred from the stations, however, continued storage in the stations is not prohibited.

Accident sequences UF1-1, UF2-1, and associated IROFS4 and 5 are applicable.

12.2.2.2Cascade System

The Cascade System is operational as described in ISA Summary § 3.4.3 with the exception that not all individual cascades are operable. Cascade modules are brought online incrementally when the centrifuges within each cascade and all support equipment related to each cascade module are commissioned. Cascade modules 1 through 6 may be operating at the beginning of Production Phase 1a. LBDCR-11-0038

Accident sequence EE-SEISMIC-SBM and associated IROFS41 is applicable.

12.2.2.3Product Take-off System

The Product Take-off System is operational as described in ISA Summary § 3.4.4 except a minimum of three (3) Product LTTS are required to be operable for FCOL enrichment operation. As construction progresses, additional Product LTTS are brought online as needed to support the incremental start up of cascades. All operable Product LTTS not in use for enrichment operations may contain an empty or full 30B cylinder or test weight. When additional storage locations become available, the stored cylinders may be transferred from the stations, however, continued storage in the stations is not prohibited.

Accident sequences PT2-1 and PT2-2 and associated IROFS1 and IROFS2 are applicable. LBDCR-11-0007

12.2.2.4Tails Take-off System

The Tails Take-off System is operational as described in ISA Summary § 3.4.5 except a minimum of three (3) Tails LTTS are required to be operable for FCOL enrichment operations. As construction progresses, additional Tails LTTS are brought online as needed to support the incremental start up of cascades. All operational stations not in use for enrichment operations may contain a 48Y cylinder (Feed, empty or full Tails, or test weight). When additional storage locations become available, the stored cylinders may be transferred from the stations, however, continued storage in the stations is not prohibited. Once an in-service feed cylinder is emptied, it is switched with a full feed cylinder from a tails station. The empty feed cylinder is then used for normal tails take-off. This cylinder storage strategy will allow approximately 3 months of operation before additional cylinder storage space is required. Accident sequence TT2-1 and associated IROFS1 and 2 are applicable. LBDCR-11-0038

12.2.2.5Product Blending System

The Product Blending System is not operational and is not needed for Production Phase 1a; however, the Blending Donor and Receiver Stations are operable for storage of full product cylinders.

Accident sequences PB1-1 and PB2-1 and associated IROFS1, 2, 4, and 5 are applicable.

12.2.2.6Product Liquid Sampling System

The Product Liquid Sampling System is not operational and is not required for Production Phase 1a. The Product Liquid Sampling autoclaves are unavailable. Because the autoclaves are not available, accident sequences PB4-1, PB4-2, PB4-3, and PB4-4, EE-TORNADO MISSILE-SBM PUBLIC, and EE-SEISMIC-SBM and associated IROFS10, 11, 12, and 28 are not applicable to the autoclave. (**Note:** EE-TORNADO MISSILE-SBM PUBLIC, and EE-SEISMIC-SBM are applicable to the SBM but the autoclave contribution to the total release [and therefore IROFS28] is not applicable.) LBDCR-11-0038

12.2.2.7Contingency Dump System

The Contingency Dump System is operational as described in ISA Summary § 3.4.8 for each operating Cascade Module. Each operating cascade module has its own dedicated Contingency Dump System available for use. As additional cascades are completed, additional contingency dump components are installed and made operational in the process services corridor to support incremental plant start up and expansion.

There is no accident sequence or IROFS directly associated with the Contingency Dump System.

12.2.2.8Gaseous Effluent Vent Systems (GEVS)

The Gaseous Effluent Ventilation System (GEVS) is constructed as two separate systems, Pumped Extract GEVS and CRDB GEVS. Pumped Extract GEVS is permanently installed in the UF_6 Handling Area of SBM-1001 and is operational to support SBM-1001 operations. The local extract ductwork that is used in the SBM is temporarily connected to the Pumped Extract GEVS. Because of this temporary cross-connection, there are limitations to the local extract capability. The minimum desired target velocity in the GEVS header cannot be maintained when local extract flexible hoses are in use while connected to Pumped Extract GEVS. However, this reduced velocity has been evaluated in CALC-M-0020 and has been shown to be acceptable based on the resulting worst case holdup conditions. Because Pumped Extract GEVS is a safe-by-design system, there is no criticality issue. With worst case holdup conditions assumed (i.e., the entire assumed 800 grams of uranium at 5% enrichment [~1.2 kg of UF_6] collected at a single point source) the resulting radiation dose rate is less than 0.05 mrem/hr. When spread out over the entire length of GEVS piping, the radiation dose due to GEVS holdup is negligible. The following measures are in place to ensure adequate flow is provided at each local extract station: LBDCR-11-0038 LBDCR-11-0028

- Only two local extract flexible hose stations are allowed to be open at any one time (IF the Ventilated Storage Room is online, THEN only one flexible hose station is allowed to be in use). LBDCR-11-0027
- Configuration control is maintained by the Shift Manager and the use of caution tags on the local extract flexible hose station isolation valves.

All GEVS accident sequences (CL3-1, CL3-2, CL3-3, VR1-1, VR1-2, VR 2-2, and FF25-2) and associated IROFS (IROFS20, 21, 24a, and 24b, and 37) are for CRDB operations and therefore not applicable to Production Phase 1a and 1b. LBDCR-11-0027

Accident sequence LOSS OF SAFE-BY-DESIGN ATTRIBUTE is applicable for the pumped Extract GEVS.

There is no accident sequence or IROFS directly associated with the local extract function of the CRDB GEVS.

12.2.2.9Material Handling Processes

12.2.2.9.1Cylinder Receipt and Shipping

Until the CRDB becomes available, cylinders are shipped, received, and transferred via a Vehicle Loading and Unloading Area on the west side of the UF_6 Handling Area of SBM-1001. The Vehicle Loading and Unloading Area provide space for the following services: LBDCR-11-0038

- Cylinder loading and unloading
- Preparation for overpack/protective structural packaging.

The cylinders are received, shipped, and transferred to and from the UF_6 Handling Area at the Vehicle Loading and Unloading Area until the CRDB and becomes operational.

12.2.2.9.2Description

Commercial transport tractors are disconnected from the trailers carry containers and connected to LES yard tractors which comply with IROFS36c (diesel fuel capacity less than 280 L (74 gal)). The yard tractor delivers UF_6 cylinders (i.e., full 48Y feed cylinders, and new or cleaned 30B product cylinders) to the Vehicle Loading and Unloading Area on the west side, south end of SBM-1001. Cylinders are unloaded with a gantry crane. The gantry crane lifts and transfers the cylinder to the rail transporter that sits on rails that are extended outside the SBM into the Vehicle Loading and Unloading Area. Upon completion of receipt inspection, the rail transporter moves the cylinder inside the UF_6 Handling Area. Cylinders are removed from the facility in the same fashion.

12.2.2.9.3Equipment

The following equipment is used for cylinder handling on the West side SBM-1001 receipt platform.

A.Vehicle Loading and Unloading Area

The Vehicle Loading and Unloading Area is located adjacent to the west side SBM-1001 equipment hatch. This provides a safe method of transfer from the vehicle trailer to rail transporter located on the platform. LBDCR-11-0038

Accident sequence FF7-1 and associated IROFS36c is applicable to the LES yard tractor at the Vehicle Loading and Unloading Area.

B.Gantry Crane

A dedicated gantry crane is used to handle cylinders on the vehicle loading and unloading area. The crane spans the width of the loading platform to access vehicle trailers and the rail transporter. The hoist has a maximum lift of approximately 6.1 m (20 ft). Crane specifications are as follows:

- Span 11.3 m (37 ft)
- Capacity 20 MT (44,100 lb)

- •Hoist lift height — 3.1 m (20 ft)
- •Hoist lift speed — 3 m/min & 0.5 m/min (10 ft/min & 1.6 ft/min)
- •Travel length — 7.9 m (26 ft)
- •Bridge travel speed (VFD) — 19.8 m/min (65 ft/min)
- •Brake type — Direct Current Disk

There is no accident sequence or IROFS directly associated with the gantry crane.

C.Scale

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Inventory Weighing is performed using a temporary scale in the UF_6 Handling Area of SBM-1001. The scale is identical to the scales described in ISA Summary § 3.4.11.1.2 C. Each cylinder that enters or exits the UF_6 Handling Area is weighed. A weigh scale capable of weighing a load of 17 MT (37,500 lb) and capable of accepting a load of 20 MT (44,100 lb) is installed. The scale is capable of weighing to a tolerance of ±2.5 kg (±5.5 lb). The scale has reader and printout facilities.

There is no accident sequence or IROFS directly associated with the weigh scales.

D.Powered Vehicles and Rail Transporters

LES yard tractors that comply with IROFS36c (diesel fuel capacity less than 280 L) are utilized to deliver the vehicle trailer containing cylinders to the Vehicle Loading and Unloading Area. The gantry crane lifts and transfers the cylinder to the rail transporter that sits on rails extended outside the SBM into the Vehicle Loading and Unloading Area. On completion of receipt inspection, the rail transporter retrieves the cylinder for use. Cylinders are removed from the facility in the same fashion.

Accident sequence FF7-1 and associated IROFS36c is applicable to the LES yard tractors at the Vehicle Loading and Unloading Area.

There is no accident sequence or IROFS directly associated with the Rail Transporter.

12.2.2.9.4Storage

A.All available operable feed, feed purification, and tails, stations that are not in operation for enrichment can be used for 48Y cylinder storage (Feed, empty or full Tails, or test weight). All Product and Blending System Stations not in use for enrichment operations can be used for 30B cylinder storage.

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B.A switch process is used to maximize storage in the stations during phased operations. When a product cylinder is filled, the process will shift to the standby product station. The full product cylinder may be switched with an empty product cylinder being stored in a Blending System Donor or Receiver Station. The full product cylinder will be stored in the now empty Blending System Donor or Receiver station that previously contained the empty product cylinder. When available Blending System Donor or Receiver stations may contain full product cylinders, additional filled product cylinders will simply remain in their respective Product LTTS for storage. This switching process is also used for feed and tails cylinders. As the feed cylinder empties, the process will shift to the standby feed station. The empty feed cylinder is then switched with a full feed cylinder from a Tails or Feed Purification LTTS. Additional product cylinders may be stored in UX30 overpacks and places in approved

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areas within the UF6 Handling Area using a pallet jack. The empty feed cylinder is installed into the now empty Tails or Feed Purification LTTS that previously contained the full feed cylinder. This switching of cylinders will allow approximately 3 months of operation before additional storage space is required.

C. In the event that additional storage is required, filled tails cylinders may be shipped off-site to a licensed facility. When additional storage capabilities are established, these cylinders may be shipped back to the site.

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Accident sequences UF1-1, UF2-1, PT2-1, PT2-2, TT2-1, PB1-1, PB2-1, PB2-2, and CP1-2 and associated IROFS1, 2, 4, 5, and 16a are applicable.

12.2.3 Utility and Support System Differences for Production Phase 1a and 1b

12.2.3.1 Centrifuge Cooling Water System (CCWS)

The Centrifuge Cooling Water (CCW) System is operational with the exception of the cooling water towers. The cooling water towers are bypassed and heat removal is performed by the CCW heat exchanger cooled by the CCW chiller units. This arrangement supports all operable cascades for Production Phase 1a and 1b.

There is no accident sequence or IRORS directly associated with CCWS.

12.2.3.2 Reserved

12.2.3.3 Solid Waste Collection System

The Solid Waste Collection System is not operational. Solid wastes will either be stored on site using appropriate chemical, radiological, and criticality safety controls until the Solid Waste Collection Room is completed or shipped off site to a processing facility for treatment and/or disposal at a licensed facility.

Because the Solid Waste Collection Room is not completed, accident sequences SW1-1 and SW1-2 and associated IROFS14a and IROFS14b are not applicable to this system.

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12.2.3.4 Decontamination Workshop

The Decontamination Workshop is not operational. Contaminated equipment is stored in accordance with appropriate chemical, radiological, and criticality safety controls until the Decontamination Workshop is completed or shipped off site to a processing facility for treatment and/or disposal at a licensed facility.

Because the Decontamination Workshop is not completed, accident sequence LOSS OF SAFE-BY-DESIGN ATTRIBUTE is not applicable to this room.

12.2.3.5 PFPE Oil Recovery System

The PFPE Oil Recovery System is not operational; however, the system has no impact on any safety aspect of facility operation. PFPE oil will either be appropriately stored on site until the system is operational or disposed of at a certified disposal facility.

~~Because the PFPE Oil Recovery System is not completed, accident sequences FR1-1, FR1-2, FR2-1, and FR2-2 and associated IROFS14a and 14b and accident sequence LOSS OF SAFE-BY-DESIGN ATTRIBUTE are not applicable to this system.~~ LBDCR-11-0038

~~12.2.3.6Ventilated Room~~

~~The Ventilated Room is not operational. A Ventilated Storage Room has been constructed in the UF_6 Handling Area in SBM-1001 for limited storage. This room is connected to the Pumped Extract GEVS. The room is used for storage only; no processing of equipment or materials is conducted. Although a leaking valve on a cylinder containing UF_6 is not expected, if one is identified, the potential leakage is stopped in one of three ways depending on the nature of the damage. The valve is capped, the valve stem is tightened or the packing gland is tightened and the cylinder stored in an appropriate (feed or product) station until repairs can be conducted or the cylinder can be returned to the vendor.~~ LBDCR-11-0027

~~Transitional accident sequences TVR1-1, TVR1-2, and TVR1-3 have been identified that require implementation of existing IROFS14a and 14b, and IROFS31a, 31b, and 31c. See ISA Summary Tables 4-4, Transitional Accident Sequence and Risk Index, and 4-5, Transitional Accident Sequence Descriptions.~~ LBDCR-11-0027

~~12.2.3.7Chemical Laboratory~~

~~The Chemical Laboratory is not operational. Instead, samples are collected and shipped to a certified testing facility for analysis.~~

~~Because the Chemical Laboratory is not completed, accident sequences CL3-1, CL3-2, and CL3-3 and associated IROFS24b, 43, and 46 and LOSS OF SAFE-BY-DESIGN ATTRIBUTE are not applicable to this room.~~

~~12.2.4Safety Significance~~

~~Section 12.0 of the Safety Analysis Report has been initially established as an administrative change to describe the Phased Operation concept. There is no safety significance because none of the identified changes will be finalized and implemented until reviewed and approved in accordance with the LES configuration management program as described in § 11.1, Management Measures. Pursuant to 10 CFR 70.72, LES has established a system to evaluate, implement, and track each change to the site, structures, processes, systems, equipment, components, computer programs, and activities of personnel. Configuration management of IROFS, and any items that are essential tomay affect the function of IROFS, is applied to all items identified within the scope of the IROFS boundary. All changes to structures, systems, equipment, components, and activities of personnel within the identified IROFS boundary are evaluated before the change is implemented. If the change requires an amendment to the License, Nuclear Regulatory Commission approval is received prior to implementation.~~ LBDCR-11-0038 LBDCR-11-0034

~~All proposed changes described in Section 12.0 are tracked and evaluated per the LES configuration management program prior to implementation. As the changes are processed, Section 12.0 will be revised to incorporate changes to the facility, processes, and programs. Section 12.0 documents all site changes facilitated as a result of the Phased Operation approach.~~

~~12.3Production Phase 2~~

~~Functions supporting sample analysis, wet and dry low level waste collection and treatment, and radioactive decontamination and maintenance of plant equipment are available. Additional cascades and support equipment are added to increase production, but the plant is fully capable of carrying out continuous commercial production.~~

LBDCR-11-0038

~~12.4Production Phase 3~~

~~Cascade modules in Cascade Hall 1002 are started up incrementally as needed to support continued plant expansion. This incremental start up continues until Cascade Halls 1001 and 1002 are fully operational.~~

LBDCR-11-0038

~~12.5Production Phase 4~~

~~Construction of remaining SBMs is completed and cascade modules started up incrementally as needed to support final plant expansion. This incremental start up continues until all Cascade Halls are fully operational. The duration of this phase is dependent on the final approved design and SWU capacity.~~

LBDCR-11-0038