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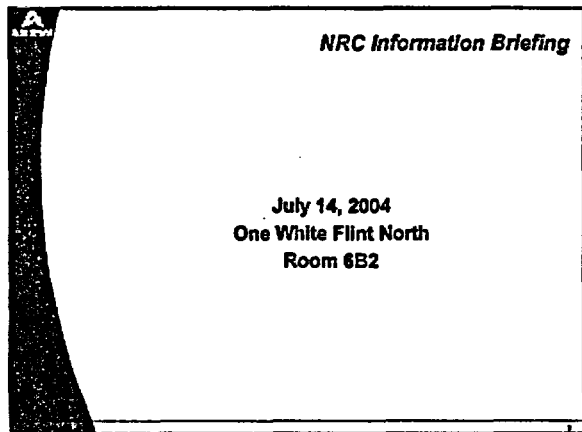
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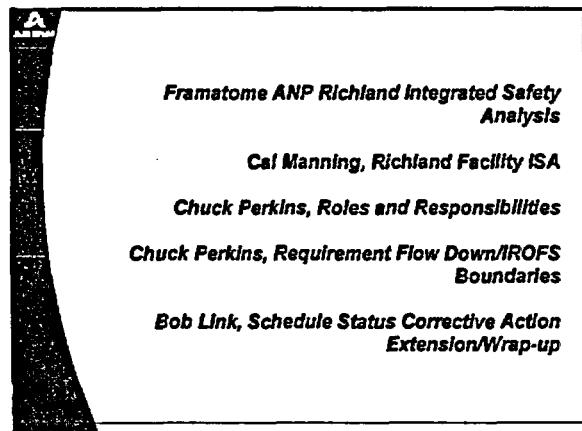
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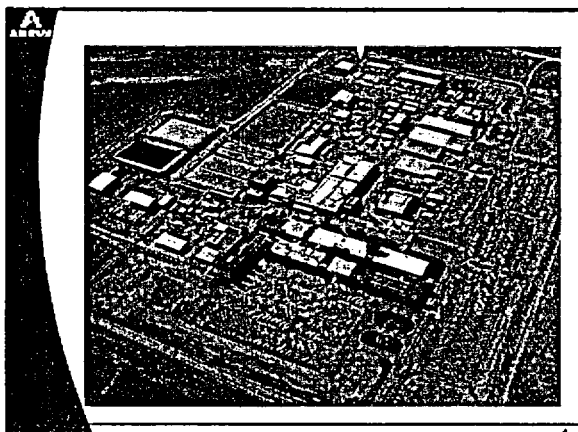
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**ISA Summary Will Be a Two Part Document**

- > Part I contains plant wide / generic information
  - Part I controlled and approved by revision number
- > Part II contains building / process specific information
  - One chapter covers each major building
    - A section in each chapter devoted to a process system
  - Individual chapters controlled and approved by revision number

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**Per NRC Guidance Natural Phenomenon Exceeding Uniform Building Code Design Basis Is Highly Unlikely**

- > Seismic Events
- > Volcanoes
- > Fires
- > High Winds
- > Lightning Strike
- > Intense Local Precipitation

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### Global Handling of Man-made Hazards

- > Transportation Accidents / Hazardous Material Spills
- > Aircraft Crashes
- > Dam Failure

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### Building to Building Interaction Team

- > Dealt with global issues such as:
  - Potential of large fires involving multiple buildings causing a radiological consequence of concern.
  - High energy sources causing a radiological consequence of concern.
  - Chemical release forcing a building evacuation resulting in a radiological consequence of concern.

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### Global Handling of Radiological Consequences

- > On-site worker exposure to "nuisance" dust levels as  $UO_2$  for 8 hours remains a low consequence.
- > Off-site environmental is limiting radiological consequence.
  - Typically requires large masses to reach intermediate
  - HEPA filters provide protection
  - Catastrophic HEPA failure modes:
    - Large Fire (Highly unlikely)
    - High  $\Delta P$  (Prevented by design)

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### Handling of Potential Chemical Exposure

- > Containment / confinement based on design
- > Personal Protective Equipment
- > "See and Flee" response
- > Area Evacuation alone will not cause unacceptable consequences to the facility or personnel
- > Emergency Response Actions

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### ISA Approach

- > Plant is divided into process systems
- > Establish teams and evaluated potential accident sequences
  - Extensive safety documentation already existed
  - Looked for gaps in and between the existing safety analyses
- > Team evaluated consequences of credible accident sequences
  - Established Bounding Sequences with consequences of concern
  - Designated appropriate IROFS and ensured adequate protection effectiveness
- > Operating component with technical support and EHS&L review, establishes IROF's boundaries and implementation flow down

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### Richland ISA Project Team Members and Participants

- > Three ISA teams working in parallel
- > Team Leader for each ISA team
- > ISA team membership includes representation for the following work groups
  - Process / Maintenance Engineering
  - Operations
  - EHS&L (Safety Disciplines)

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**Richland ISA Project  
Process Flow**

- > ISA teams identify and analyze process hazards on a system basis
- > Establish potential consequences for a particular process hazard
  - Worker, public and environment
- > Develop accident sequences for high and intermediate consequence events
- > Evaluate Risk of uncontrolled and unmitigated consequences
- > Identify IROFS to obtain an acceptable risk index for the accident sequence

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**Consequence Categories**

Category	Qualitative Descriptor	Effects from Chemical Exposure	Effects from Fire Hazards Exposure	Effects from Difficulty Hazards Exposure	Effects from Radiological Hazards Exposure
A	Negligible	Unlikely to cause transient health effects to a worker or others could be detectable at the controlled area boundary	Fire which could cause nonconsequence radiological or chemical consequences		Contamination / radiation doses less than 10 CFR 20 limits
B	Restricted / Low time work injury or multiple medical treatment cases	Could cause mild transient health effects to a worker	Fire which could cause nonconsequence radiological or chemical consequences		Exposure of worker or member of public is greater than 10 CFR 20 limits
C (Part 70 Inter- mediate)	Persistent loss of function/body or multiple lost time injuries	Could lead to irreversible or other serious, long-lasting health effects to a worker or could cause mild transient health effects to an individual at the controlled area boundary	Fire which could cause nonconsequence radiological or chemical consequences		Acute worker dose of 25 rem, acute dose at site boundary of 5 rem or 34 hour average release exceeding 2000 times Table 2 value of 10 CFR 20, Appendix B if restricted area boundary

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**Consequence Categories (cont.)**

Category	Qualitative Descriptor	Effects from Chemical Exposure	Effects from Fire Hazards Exposure	Effects from Difficulty Hazards Exposure	Effects from Radiological Hazards Exposure
D (Part 70 High)	Fatality or multiple permanent health effects	Could endanger the life of a worker or could lead to irreversible or other serious, long-lasting health effects to an individual at the controlled area boundary	Fire which could cause nonconsequence radiological or chemical consequences		Acute worker dose of 100 rem, or Acute dose at site boundary of 25 rem or intake of 30 rem results equivalent to an individual at the controlled area boundary
E (Part 70 High)	Multiple fatalities	A 30 minute exposure that could be immediately dangerous to the life and health of a worker or could endanger the life of an individual at the controlled area boundary	Fire which could cause nonconsequence radiological or chemical consequences	Occurrence of a nuclear accident which could cause nonconsequence radiological effects	Lethal Radiation dose

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Initiating Event/Failure			
Frequency Index Number	Based on Evidence	Based on Type of ROPS	Comments
-6	External event with frequency of less than 1/100,000 years.		Highly unlikely initiating event. No ROPS are needed for this sequence.
-4	No failures in 30 years for hundreds of similar controls in industry.	Exceptionally robust passive engineered control (PEC), or an inherently safe process, or two redundant controls better than simple administrative controls.	This frequency can rarely be justified by evidence; most types of single ROPS have been observed to fail.
-3	No failures in 30 years for tens of similar controls in industry.	A single PEC or an active engineered control (AEC) with high availability (e.g., functionally locked on a regular basis).	Not likely to occur even one time during the lifetime of the facility.
-2	No failure of this type in this plant in 30 years.	A single ABC, or an enhanced administrative control, or an administrative control for routine planned operations.	Not likely to occur during the process system life cycle.

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Initiating Event/Failure (cont.)			
Frequency Index Number	Based on Evidence	Based on Type of ROPS	Comments
-1	A few failures may occur during plant lifetime.	An administrative control that must be performed in response to a rare unplanned demand with adequate response time.	Likely to occur sometime during process system life cycle.
0	Failures occur every 1-3 years.	No protection.	Likely to occur several times during process system life cycle.
1	Several occurrences per year.		Likely to occur repeatedly during process system life cycle.

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Integrated Safety Analysis Acceptable Risk							
SEVERITY OF CONSEQUENCES	Likelihood						
	Highly Unlikely		Unlikely		Not Unlikely		
	<-4	>-4	-4	-3	-1	0	
	I	II	III	IV	V	VI	VII
High	II	III	IV	V	VI	VII	VIII
Intermediate	III	IV	V	VI	VII	VIII	IX
Site-Specific Concern	IV	V	VI	VII	VIII	IX	X
Low/Negligible	V	VI	VII	VIII	IX	X	XI

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### IROFS SELECTED

> Protection effectiveness established considering:

- Type of IROFS
- Plant/vendor history of availability and reliability
- Independence of other IROFS
- Management measures that can be applied

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### Controlled Event Index (CEI) Determination

>  $CEI = \text{INITIATING EVENT FREQUENCY} \times \text{PROTECTION EFFECTIVENESS INDEX NUMBERS}$

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### Protection Effectiveness

PFOO Index Number	Probability of Failure on Demand	Based on Type of Control
-4 or -5	$10^{-4} - 10^{-5}$	Exceptionally robust passive engineered control (PECC), or an inherently safe process, or two redundant controls (better than simple administrative controls)
-3 or -4	$10^{-3} - 10^{-4}$	A single PEC or an active engineered control (AEC) with high availability (e.g. functionally tested on a regular basis)
-2 or -3	$10^{-2} - 10^{-3}$	A single AEC, or an enhanced administrative control, or an administrative control for routine planned operations
-1 or -2	$10^{-1} - 10^{-2}$	An administrative control that must be performed in response to a rare unplanned demand with adequate response time
0	N/A	No protection

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Initiating Event/Failure			
Frequency Index Number	Based on Evidence	Based on Type of ROPs	Comments
-6	Extremely rare with frequency of less than 1/100,000 years.		Highly unlikely initiating event. No ROPs are needed for this sequence.
-4	No failures in 30 years for hundreds of similar controls in industry.	Exceptionally robust passive engineered control (PEC), or an inherently safe process, or two redundant controls better than single administrative controls.	This frequency can rarely be justified by evidence, most types of single ROPs have been observed to fail.
-3	No failures in 30 years for tens of similar controls in industry.	A single PEC or an active engineered control (AEC) with high availability (e.g. functionally tested on a regular basis).	Not likely to occur even one time during the lifetime of the facility.
-2	No failure of this type in this plant in 30 years.	A single AEC, or an enhanced administrative control, or an administrative control for routine planned operations.	Not likely to occur during the process system life cycle.

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Initiating Event/Failure (cont.)			
Frequency Index Number	Based on Evidence	Based on Type of ROPs	Comments
-1	A few failures may occur during plant lifetime.	An administrative control that must be performed in response to a rare unplanned demand with adequate response time.	Likely to occur sometime during process system life cycle.
0	Failures occur every 1-3 years.	No protection.	Likely to occur several times during process system life cycle.
1	Several occurrences per year.		Likely to occur repeatedly during process system life cycle.

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Failure Duration		
Duration Index No.	Average Failure Duration*	Duration in Years
1	More than 3 years	10
0	1 year	1
-1	1 month	0.1
-2	A few days	0.01
-3	8 hours	0.001
-4	1 hour	10 <sup>-4</sup>
-5	5 minutes	10 <sup>-5</sup>

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### CEI Determination Based on Qualitative "Probability" of Failure on Demand

- > The accident sequence is "more than 19 kg of liquid water from a roof leak enters a blender via an open and unattended access door."
- > The initiating event is "an access door to blender is left open and unattended" and is given an initiating event index number of -1.
  - Calculating CEI Using PFODs:
  - The defenses and associated PFODs are as follows:
  - Defense 1: Primary (metal) roof over the DCF serves as a barrier against water entering from the exterior of the building.  
PFOD=-3 (Based on evidence from plant history).
  - Defense 2: Secondary (tar) roof over the DCF serves as a secondary barrier against water entering from the exterior of the building.  
PFOD=-3 (Based on evidence from plant history).
  - The resulting CEI = -1 + -3 + -3 = -7.

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### CEI Determination Based on Qualitative Failure Frequency and Failure Duration

- > The accident sequence is "more than 19 kg of liquid water from a roof leak enters a blender via an open and unattended access door."
- > The initiating event is "an access door to blender is left open and unattended" and is given an initiating event index number of -1.
  - The defenses and associated Failure Frequencies are as follows:
  - Defense 1: Primary (metal) roof over the DCF serves as a barrier against water entering from the exterior of the building.  
FF = -1 (based on evidence from plant history).
  - DUR = -3 (Based on liquid detectors between roofs and the associated alarm that initiates response).
  - Defense 2: Secondary (Tar) roof over DCF.
  - F-Freq = -2 and is based on additional protection from elements provided by metal roof. Note the omission of a duration index associated with this defense.
  - The resulting CEI = -1 + -1 + -3 + -2 = -7.

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### Integrated Safety Analysis Acceptable Risk

		Likelihood						
		Highly Unlikely		Unlikely		Not Unlikely		
SEVERITY OF CONSEQUENCES		≤-4	≤-4	-3	-2	-1	0	
	High	B	III	III	III	III	III	III
		C	III	III	III	III	III	III
	Intermediate	C	IV	III	III	III	III	III
		D	IV	IV	III	III	III	III
Site-Specific Concern	B	IV	IV	III	III	III	III	
Low/Negligible	A	IV	IV	IV	III	III	III	

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### Performance Deficiencies Identified By ISA Teams Result In HACARS

- > ISA team suggests a potential solution
- > HACAR issued to PC Manager for approach to close HACAR
- > Proposed approach reviewed / accepted by EHS&L
- > Action assigned to responsible individual
- > Action tracked to completion

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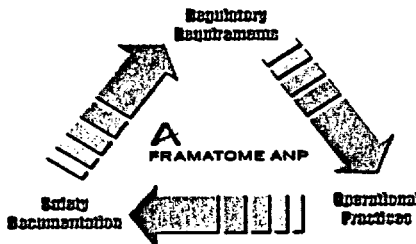
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### Summary of the Vision



- We do business the way we say we do.
- We do business the way we are required by regulation.
- Documentation reflects operational practices and regulatory requirements.

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### Organizational Roles Under the New Part 70 Regulations

- > EHS&L
  - Maintain ISA Database
  - Evaluate Impact of any document, process, hardware, or software changes that could impact IROFS and/or ISA.
  - Evaluate Impact and reportability of IROFS failures.

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**Organizational Roles Under the New Part 70 Regulations (cont.)**

> **Operations**

- Perform work activities in accordance with approved procedures
- Conform to safety limits and precautions
- Report potential IROFS failures to EHS&L and on WebCAP
- Ensure employees working in an area are trained to the procedures associated with the area/process

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**IROFS Maintenance Role**

> Maintain the availability and reliability of the IROFS by

- Configuration Management
  - ECN process for change control
  - Software revision control
  - Repair Work Order process & documentation
  - Post repair functional test decision & documentation
  - Spare part replacement in kind & substitution process
- Preventive Maintenance Program including periodic functional testing

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**Organizational Roles Under the New Part 70 Regulations (cont.)**

> **Projects**

- Changes must be evaluated for impacts on the ISA (ECN procedure)
- Modifications need to maintain the functionality of existing IROFS
- New hazards introduced by new processes or construction activities to implement new processes must be evaluated for impact on the ISA

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**Organizational Roles Under the New Part 70 Regulations (cont.)**

**> Information Services**

- Changes must be evaluated for impacts on the ISA (SSR procedure)
- Modifications need to maintain the functionality of existing IROFS
- New hazards introduced by new programs or computer maintenance activities must be evaluated for impact on the ISA

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**Organizational Roles Under the New Part 70 Regulations (cont.)**

**> Training**

- Initial training
  - ISA process
  - IROFS
  - Change control processes
- Periodic refresher training
  - ISA process
  - IROFS
  - Change control processes
- Continuous training, including SOPs that are or contain IROFS

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**Organizational Roles Under the New Part 70 Regulations (cont.)**

**> Procurement**

- Replacement equipment must maintain the performance requirements to meet the ISA functionality
- Comply with essential material specifications and Quality / Safety Standards associated with IROFS

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### Organizational Roles Under the New Part 70 Regulations (cont.)

- > **Quality Assurance**
  - Ensure WebCAP maintains a history of potential IROFS failures
  - Ensure appropriate cause analysis and corrective action follow-up

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### ISA Based Safety Program Management Measures

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### ISA Based Safety Program Management Measures

- > Administrative actions to insure IROFS are available and reliable to perform function when required.
  - Configuration Management Program
    - ECN Process
    - Document Change Process
  - Preventive Maintenance Program
  - Instrument Repetitive Maintenance Program
  - Functional Checks/Surveillances
  - Training
  - Problem Identification and Corrective Action Follow-up

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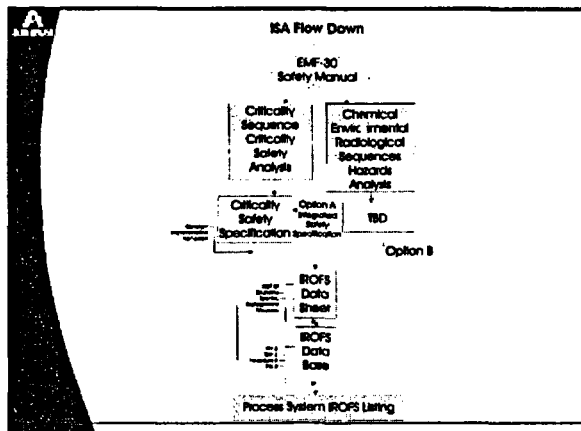
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**DRAFT Example of Process System IROFS Listing**

Area E-316 - Pallet Press

ISOP Number	ISOP Description	Process Description	ISOP Number	ISOP Description
1622	When loaded, the ISOP for all pallet presses requires inspection of the pallet press. The ISOP for all pallet presses requires inspection of the pallet press. The ISOP for all pallet presses requires inspection of the pallet press.	This ISOP is to be used to ensure that the pallet press is properly maintained and that the pallet press is properly maintained and that the pallet press is properly maintained.	ISOP 1622	When loaded, the ISOP for all pallet presses requires inspection of the pallet press. The ISOP for all pallet presses requires inspection of the pallet press.
1625	When loaded, the ISOP for all pallet presses requires inspection of the pallet press. The ISOP for all pallet presses requires inspection of the pallet press.	This ISOP is to be used to ensure that the pallet press is properly maintained and that the pallet press is properly maintained and that the pallet press is properly maintained.	ISOP 1625	When loaded, the ISOP for all pallet presses requires inspection of the pallet press. The ISOP for all pallet presses requires inspection of the pallet press.
1627	When loaded, the ISOP for all pallet presses requires inspection of the pallet press. The ISOP for all pallet presses requires inspection of the pallet press.	This ISOP is to be used to ensure that the pallet press is properly maintained and that the pallet press is properly maintained and that the pallet press is properly maintained.	ISOP 1627	When loaded, the ISOP for all pallet presses requires inspection of the pallet press. The ISOP for all pallet presses requires inspection of the pallet press.

Place 1 bullet in the column 1622 for this ISOP to indicate the ISOP Number 1622 is needed for the ISOP. Indicate which system or equipment is required.

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- ISA Flowdown Challenges**
- > Consolidating IROFS information from various sources into a single integrated database and verifying data integrity
  - > Timely completion of IROFS flowdown verification utilizing the CSS and the IROFS Database
  - > Simultaneously implementing a new procedure control system called Documentum
  - > Employee training on new information systems and related work practice changes

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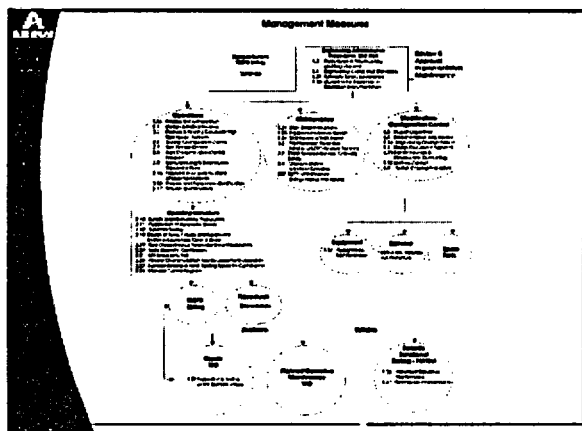
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### **Management Measures – Training Program**

- > **New Employee Orientation**
  - Regulatory Requirements
  - Quality Requirements
  - Job Specific Requirements
- > **Workstation Qualifications Guides** being revised, standardized to be completed by 05/05
 

• Chemical	Complete
• Waste	25% Done
• Ceramics	45% Done
• Rods/Assembly	90% Done
- > **Includes OJT/ written exams/ skills demonstrations**
- > **Annual Training**
  - Criticality
  - Radiation
  - General Employee Refresher (GET)
- > **Quarterly Criticality Training**
- > **Documentum Read and Acknowledge Training**

### **Management Measures – Training Program**

- > **Plateau Learning Management System**
  - Assists in managing the training function
  - Integration with Documentum, read and acknowledge
  - Indicates training requirements tied to job position
  - Random test generator/ qualification reports/ expiration of training reminders/ management of curriculum
  - Software purchased, implementation in progress
- > **Training Department trained in SAT (systematic approach to training)**



### Management Measures - Problem Identification and Corrective Action Program

- > WebCAP Implemented as our single corrective action system for all issues
- > All employees trained on its use
- > All issues follow the same process, and EHS&L closes all safety/regulatory issues
- > Part 21 Implications evaluated
- > Trending performed
  - Cause Coding
  - Common Cause Analyses
  - Repeat Issues

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### Management Measures Challenges

- > Individual procedures are currently adequate but will require enhancement for program implementation
- > Ongoing employee training on new information systems and expectations
  - Documentum
  - IROFS Data Base
  - SAP PM Module
  - WebCAP

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### Richland ISA Project Status as of 7/9/04

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### Richland ISA Project Status as of 7/9/04

- > ISA Team Risk Assessment Meetings (100% Complete)
- > ISA Accident Table Completion (82% Complete)
- > Update and Approval of Safety Documents (42% Complete)
- > IROFS Implementation and Verification (16% Complete)
- > IROFS Boundary and Descriptive Information Entered Into IROFS Database (25% Collected, 6% Complete)

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### Performance Upgrades (HACARS) Identified By ISA Project Teams

- > ISA Required Changes
  - > Total - 41
  - > Closed - 11
  - > Open - 30 (Two of the open items will remain open past 10/18/04)

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### Performance Upgrades Identified By ISA Project Teams (cont.)

- > Hot Oil Dryer NCS Scenario Involving Wrong Oil Type Added and Catastrophic Failure of Vessel
  - Current CEI = 4
  - Resolution Expected Complete by 12/05
- > H2 explosion (Industrial Safety related concern) in Calciner Offgas system
  - Current CEI = 4
  - Partial Resolution Prior to 10/18/04
  - Resolution Expected Complete by 12/05

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### Framatome ANP Licensing Actions

- > Active and Near Term Licensing Actions
- > Administrative Updates
- > Timely Renewal / New Part 70 Compliance Update

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### Near Term Licensing Actions

- > Amendment to Support BLEU
  - Material Receipt, download and storage (Amendment Approved)
  - Stack limits (approval pending)
  - Possession limit increase to 75,000 kg <sup>235</sup>U (submittal May 2005)
- > Amendment to assist Lagoon Closure Schedule

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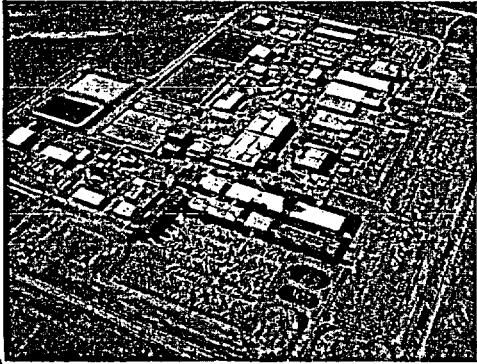

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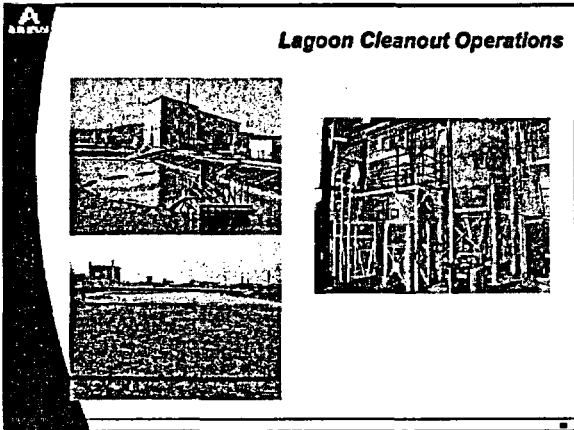
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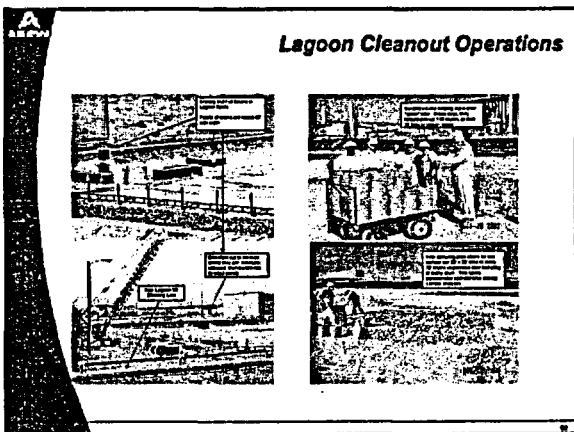
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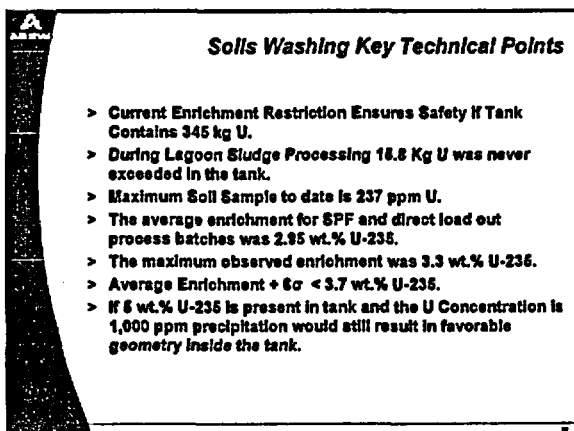
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### Administrative Updates

- > Chapter 1 Standard Conditions and Special Authorizations
  - Updates to Table I-1.1
    - Remove Lagoons, sand trench, leach pit
- > Chapter 3 Radiation Protection
  - Administrative updates
  - Minor Program Changes (Consistency with Lynchburg)
- > Chapter 4 Criticality Safety
  - Validation Issue (submitted)
  - Administrative updates
  - Minor Program Changes Program (Consistency with Lynchburg)
  - Table I-4.1 update Lagoons and LUR/SPF

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### Administrative Updates

- > Chapter 6 Special Programs
  - Administrative updates
  - Update sections describing facility to incorporate facility and program enhancements
- > Chapter 8 Radiological Contingency Plan
  - Administrative updates

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### What Is the most efficient path forward?

- > Discussion on New Part 70 Format and Timely Renewal in Nov. 2006

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