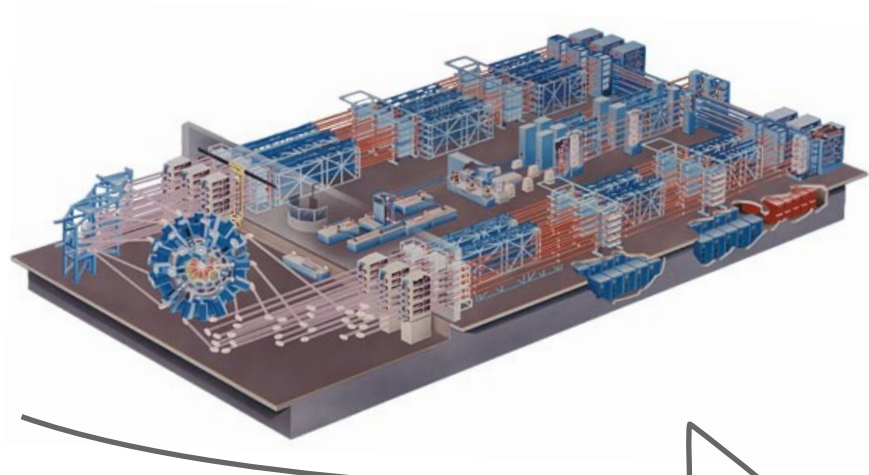


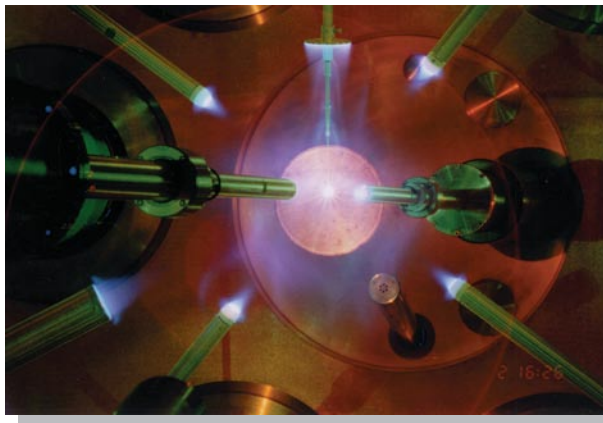
LLE Safety Overview



- Quality people
- Training
- Procedures
- Audit

+ C³I² and Discipline

- Safety
- Effectiveness



Summary

Safe and effective operations require attention to detail and a disciplined approach



- **Quality people, written procedures, procedural compliance, and effective supervision/audits are the key to safe and effective operations.**
- **Safety is a mindset—all accidents are preventable.**
- **Responsibility for operations, safety, and maintenance must be internalized.**
- **Thorough incident investigation and follow-up are required to prevent recurrence.**

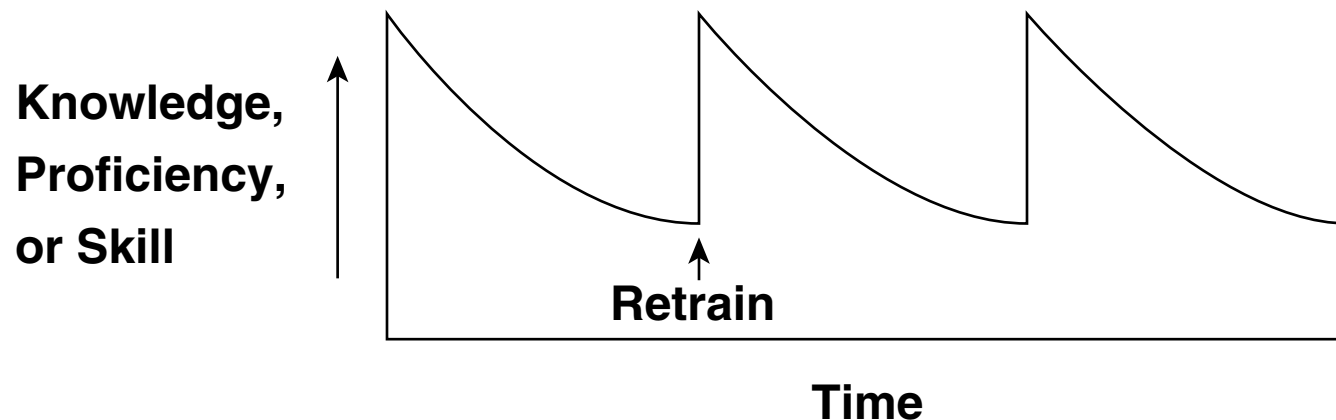
Operating a large technical facility requires technical knowledge and expertise



- **Managers must have a detailed technical knowledge.**
 - **It's a myth that business management professionals having no technical knowledge can manage a technologically complex operation.**
- **Operations management is not a textbook acquired skill—it's acquired through progressive levels of responsibility and mentoring.**
- **Training should be both theoretical and hands-on—understanding “reasons why” allows people to respond to unusual circumstances.**

Operational philosophy must recognize the fallibility of people

- Even the best people make mistakes and have a retention half-life.



- Supervision is not a matter of mistrust; rather, it recognizes that people make mistakes and proficiency decays over time.
- When the consequences of failure are high (e.g., crashing, sinking, etc.), the use of a series of checks/safety features will reduce the probability of failure.

Safety is a mindset — all accidents are preventable



- **Accidents are caused by people**
 - when they rush or
 - when they are complacent.
 - Failure to engage brain increases the probability of an accident.
- **Accident causes attributed to equipment, material, or procedure are really caused by people who**
 - inadequately designed equipment, or
 - improperly selected materials for construction, or
 - improperly assembled and/or tested equipment, or
 - improperly operated equipment, or
 - improperly maintained equipment.

Safety is everyone's business and compliance with safety procedures is MANDATORY.

LLE has a proactive safety program to ensure the safety of personnel and protection of equipment



- **LLE's safety organization has the active support and involvement of top management.**
- **Operational and safety procedures and training are emphasized.**
- **All laboratories are inspected every 6 months via monthly inspections by the four assigned safety officers.**
- **Compliance with safety procedures is mandatory.**
- **Safety is considered in design, and personal protection is provided through hardware, software, and/or procedures to the maximum extent practical.**
- **Incidents are investigated and actions taken to prevent reoccurrence.**

Incidents must be thoroughly investigated and corrective actions taken to prevent recurrence



- **An incident is any event that**
 - **causes or could have caused significant equipment damage,**
 - **results in exceeding environment-release limits, or**
 - **causes personnel to receive hospital emergency room treatment.**
- **Operations are halted until a determination by management that it is safe to continue.**
- **The incident is investigated to determine cause and corrective actions.**
- **An incident report documents the investigation and is used to track completion of corrective actions. The report outline is as follows:**
 - **description of incident**
 - **identification of apparent cause (personal, procedure, equipment, or material)**
 - **corrective actions (immediate, temporary, permanent)**

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