Waste Characterization, Reduction, and Repackaging Facility

Actinide Source-Term Test Program (STTP)

Preparations at the WCRRF

February 1994

8695

Stan Bodenstein

WCRRF General Data

- Average volume size reduction: ~3.5 : 1
- Enclosure: 250 yd^3, 452 ft^2 footprint, 0.19 in SS shell
- PAK-44 plasma cutting torch
- PAR 3000 electro-mechanical manipulator, 150 lb capacity
- Hydraulic work table:
  6000 lb, rotate 360° cw/ccw, 22" to 6' above floor, E/W lateral
- Enclosure bridge crane: 1.5 tons
- Gantry crane: 5 tons
- Vehicle air lock 360.5 ft^2
- Unpacking area: 360.5 ft^2

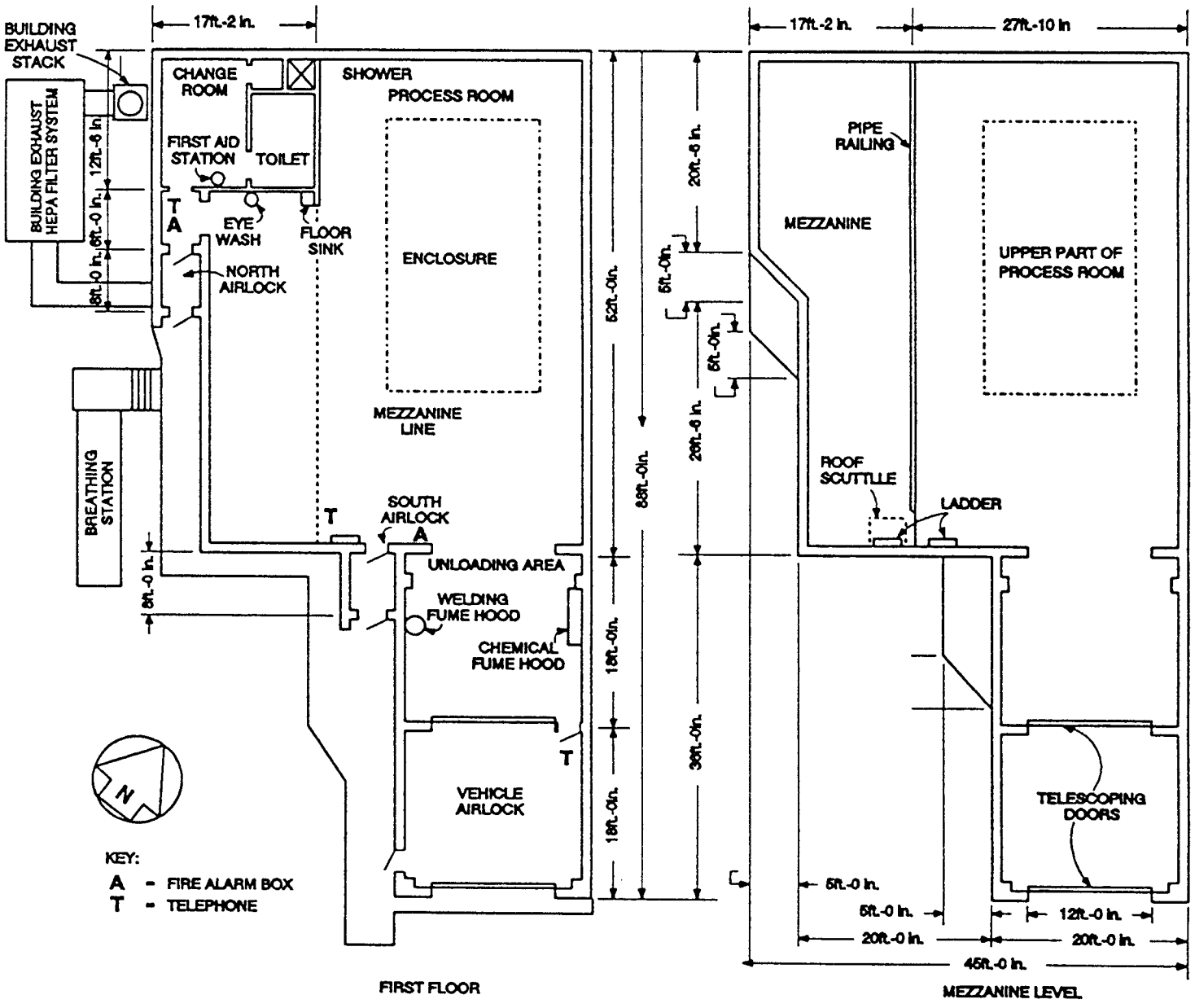


Fig. 5.1. SRF floor plan.

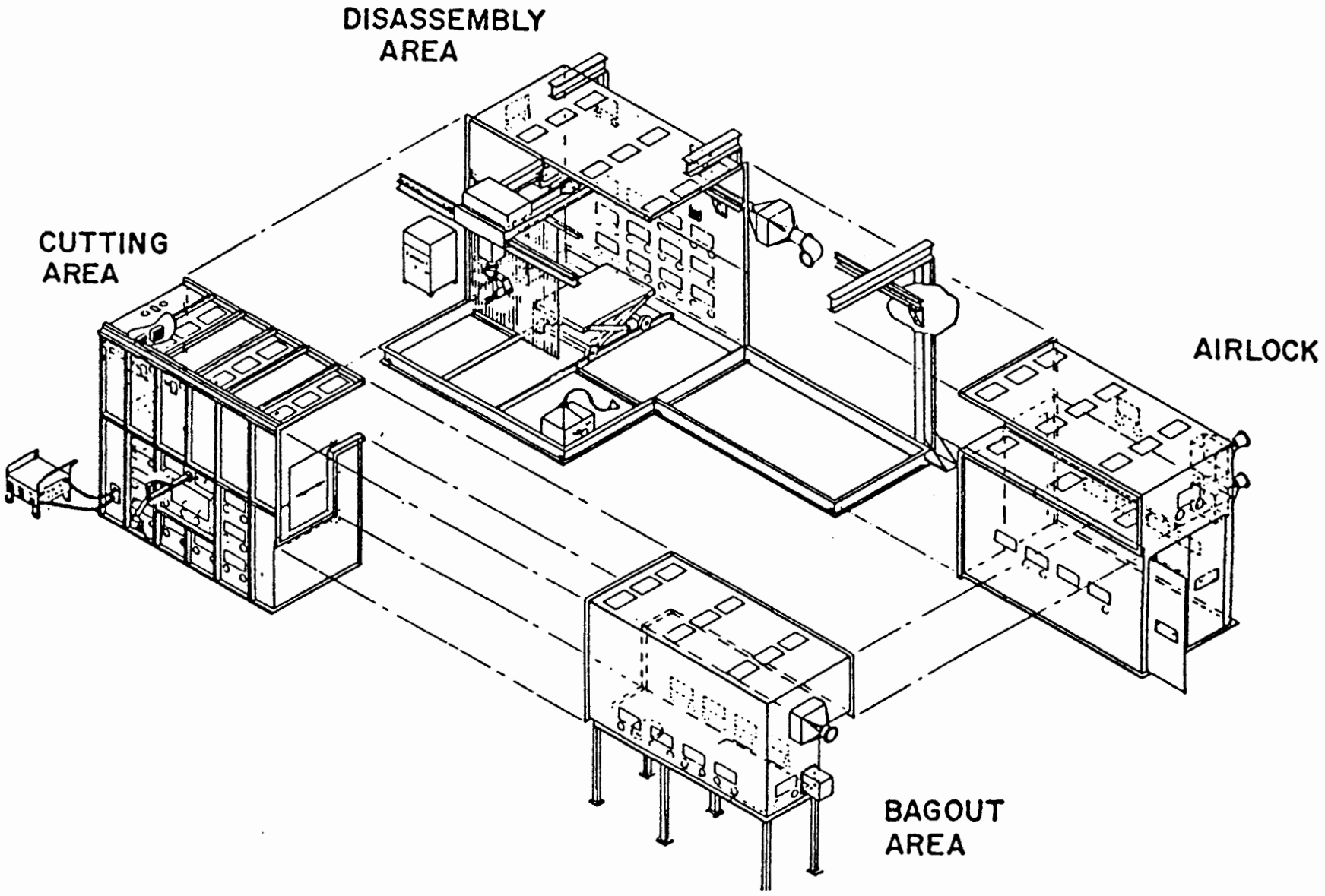
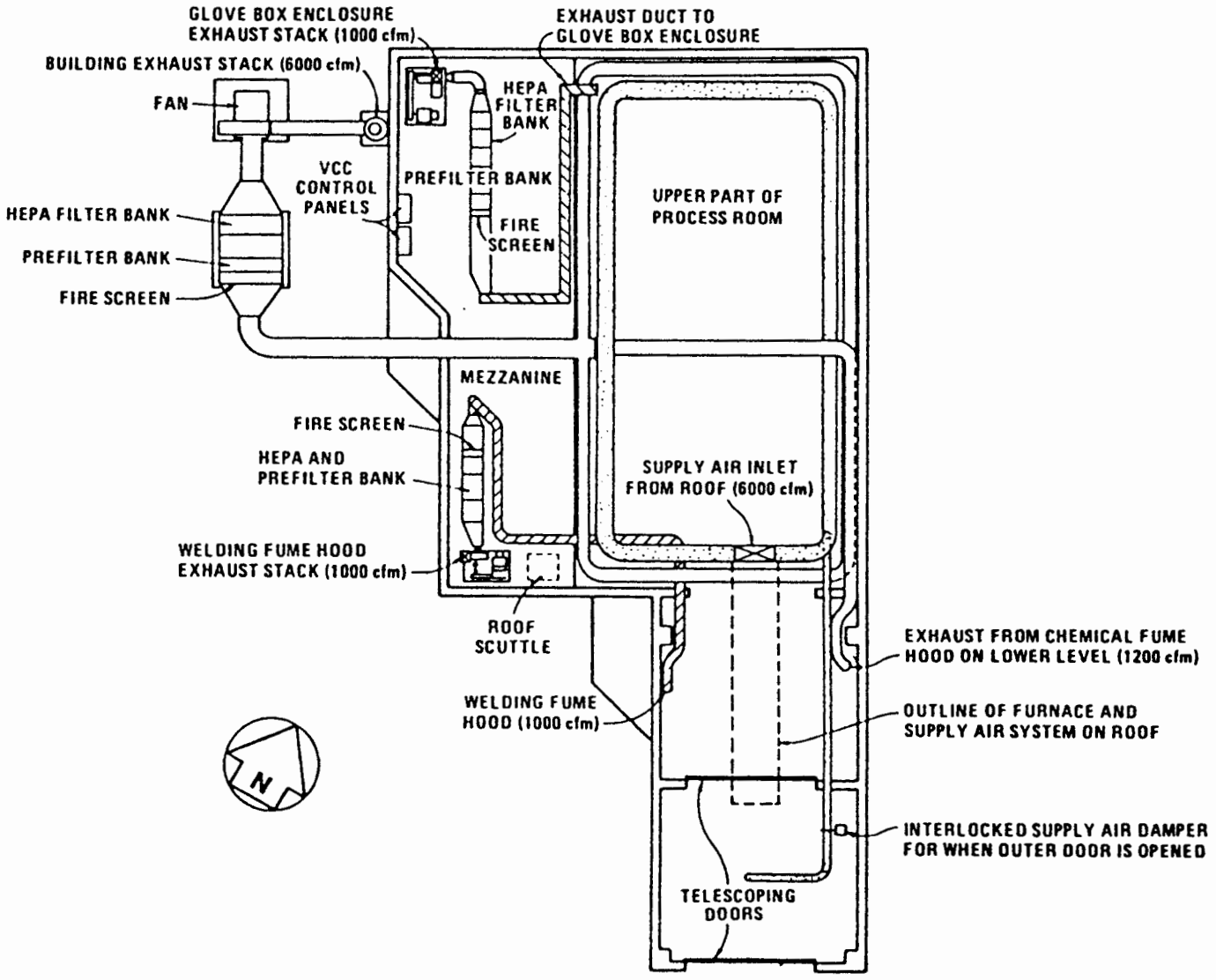


Fig. 5.2. Glovebox modules.

WCRRF Ventilation Containment Systems

Three ventilation systems

- Enclosure:
  - Roughing filter, flame arrester, pre-filter, double HEPA, monitored
  - - 0.5" w.c. with respect to the building
  - Airlock between the enclosure cutting chamber and the building
- Building:
  - Roughing filter, flame arrester, pre-filter, single HEPA, monitored
  - - 0.25" w.c. with respect to the atmosphere
  - Airlocks (vehicle & personnel) between the building and outside
- Welding Fume Hood:
  - Roughing filter, flame arrester, pre-filter, single HEPA, monitored
- Air leakage is always to the area of highest contamination potential



UPPER LEVEL VENTILATION PLAN

Fig. 6.2. Air-handling systems.

WCRRF Nuclear Limitations

- Non-reactor nuclear facility
- Safety Analysis Report and Operational Safety Requirements
- Administrative Limit (2/3 of maximum)
  - 100 gm Pu-52 (weapons grade plutonium)
  - 6.6 gm Pu-83 (heat source plutonium)
  - 10 gm Am-241

Mixtures

$$\frac{\text{gm Pu-52}}{100\ \text{gm}} + \frac{\text{gm Pu-83}}{6.6\ \text{gm}} + \frac{\text{gm Am-241}}{10\ \text{gm}} \leq 1$$

WCRRF Staff

- **WCRRF staff (CST-7 & ESH-1) are experienced:**
  - With handling actinides
  - Preparing for & performing glovebox operations
  - Performing remote operations
  - Working directly with contaminated jobs
  - Monitoring actinide contaminated jobs
  - Handling waste
  - Coordinating and executing complex projects
  - Working as a team
- **WCRRF staff:**
  - 3 mechanical technicians/operators; 1 technical supervisor
  - 2 Radiation control technicians
  - 1 Technical staff member

WCRRF Feature Application for STTP

- WCRRF features will be utilized as much as possible for ALARA, to reduce risks, to enhance the operations efficiency
- Enclosure work stations, manipulator, and enclosure crane used for contaminated work with risk and transport activities inside the enclosure
- Gantry crane, forklifts for lifting and transport outside enclosure
- Bagout & introduction ports minimize contamination and waste
- Enclosure air lock for clean, relative low risk tasks
- Transportainers for locked and weather tight staging for equipment, waste, and test vessels
- Light machining, welding, & fabrication capability for special fixtures

STTP Tasks at the SRF

- All staff studied general scope and purpose of the STTP test program and are assigned as lead system technicians
- Systems/processes designed & built with a team effort, WCRRF dedicated ESH-1 RCTs involved with each system/process
- Unique solutions developed for unusual problems
- Clean environment system testing prior to installation in enclosure
- "Standard" WCRRF operating procedures used as much as possible
- Special procedures used for each unique STTP activity
- All operators trained on each system and STTP unique procedures
- Cold, clean test runs as much as possible
- Verify that required QA checks can be performed in the WCRRF environment
- A LANL internal facility readiness assessment with DOE observation

STTP Goals at the WCRRF

- Safe operations
- Within the rules
- Future facility operations not impacted
- STTP quality checks as specified
- WCRRF operations will not adversely affect the final STTP experiment results
- Loaded test vessels not externally contaminated
- Loaded test vessels ready to ship on schedule
- Handle remaining STTP waste