



Overview of MSRR, SERC Building, and Security Planning

NRC Docket Number 50-610

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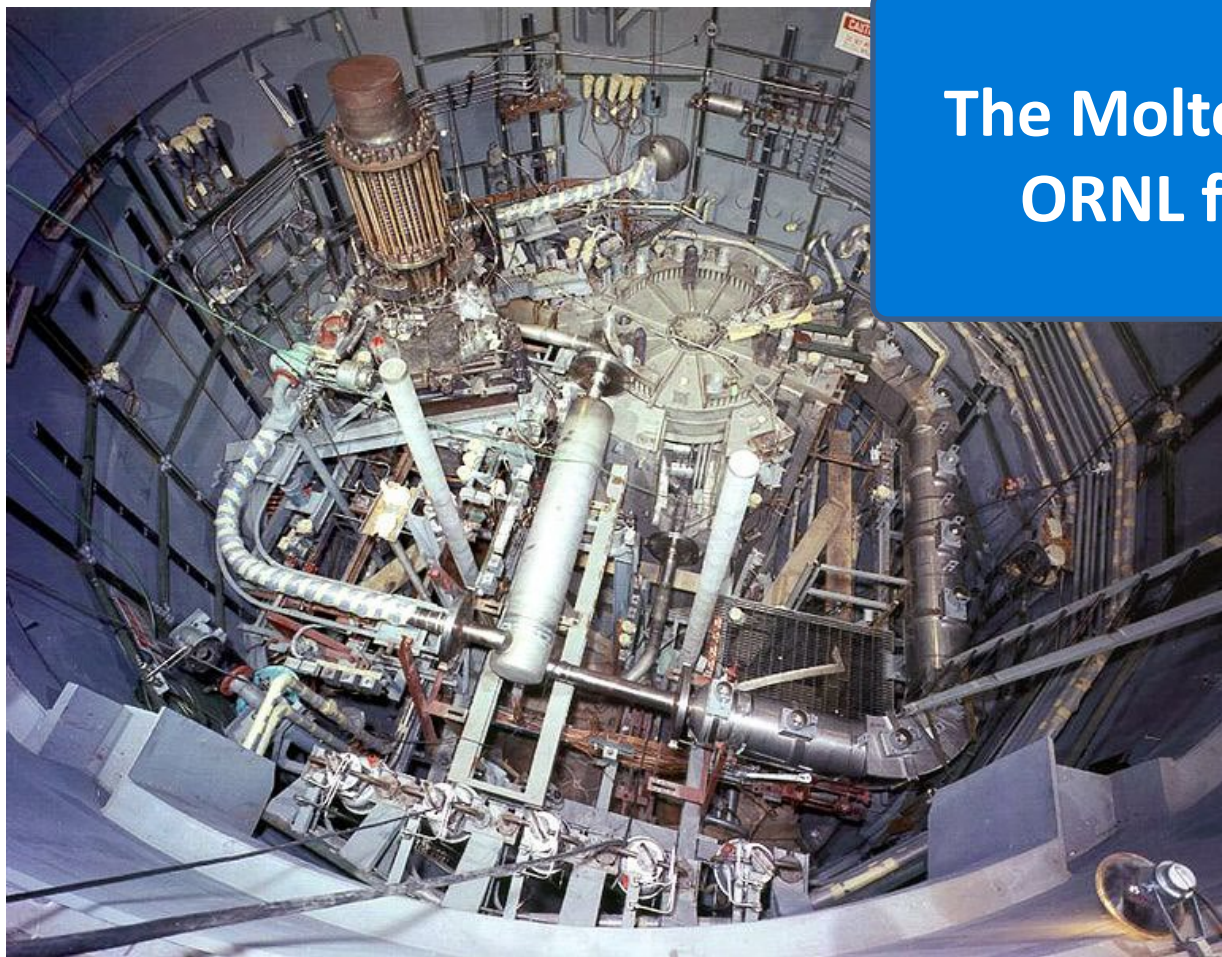
NEXT Lab Director, Abilene Christian University

April 13, 2023



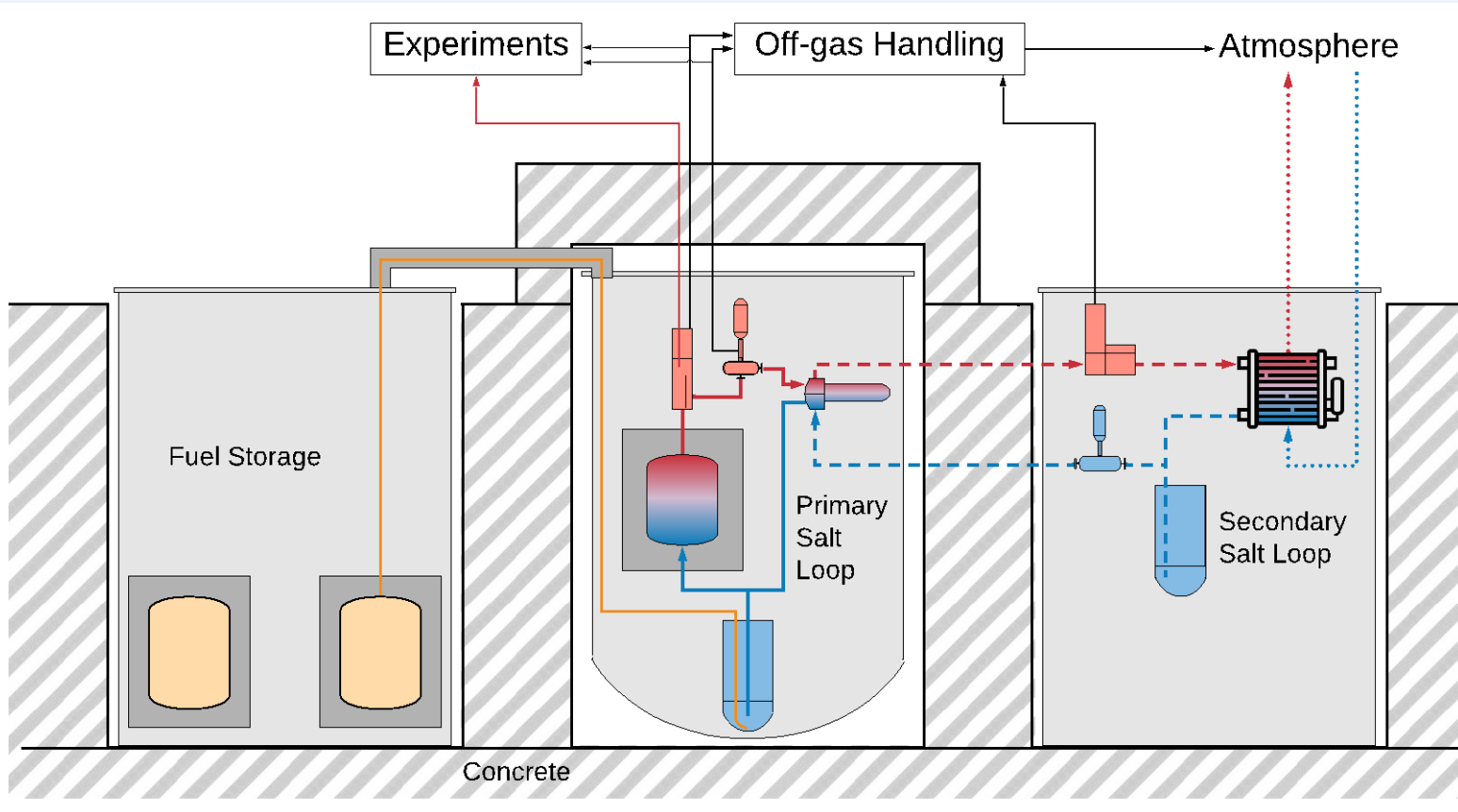
Molten Salt Research Reactor is Simplified MSRE **NEXT**

Nuclear Energy eXperimental Testing



The Molten Salt Reactor Experiment operated at ORNL from 1965-1969 on U-235 and U-233.





MSRE: shared concepts

- UF_4 LiF-BeF_2 fuel
- Loop design
- Graphite moderator
- Drain tank
- Trench-based radiation protection
- 5-years of full-power operation

MSRR: simplified concepts

- 19.75% instead of 33% ^{235}U
- 1 MWth instead of 8-10 MWth
- SS-316 instead of Hastelloy-N
- No freeze valve
- Utilizing 50 years of technology advancement

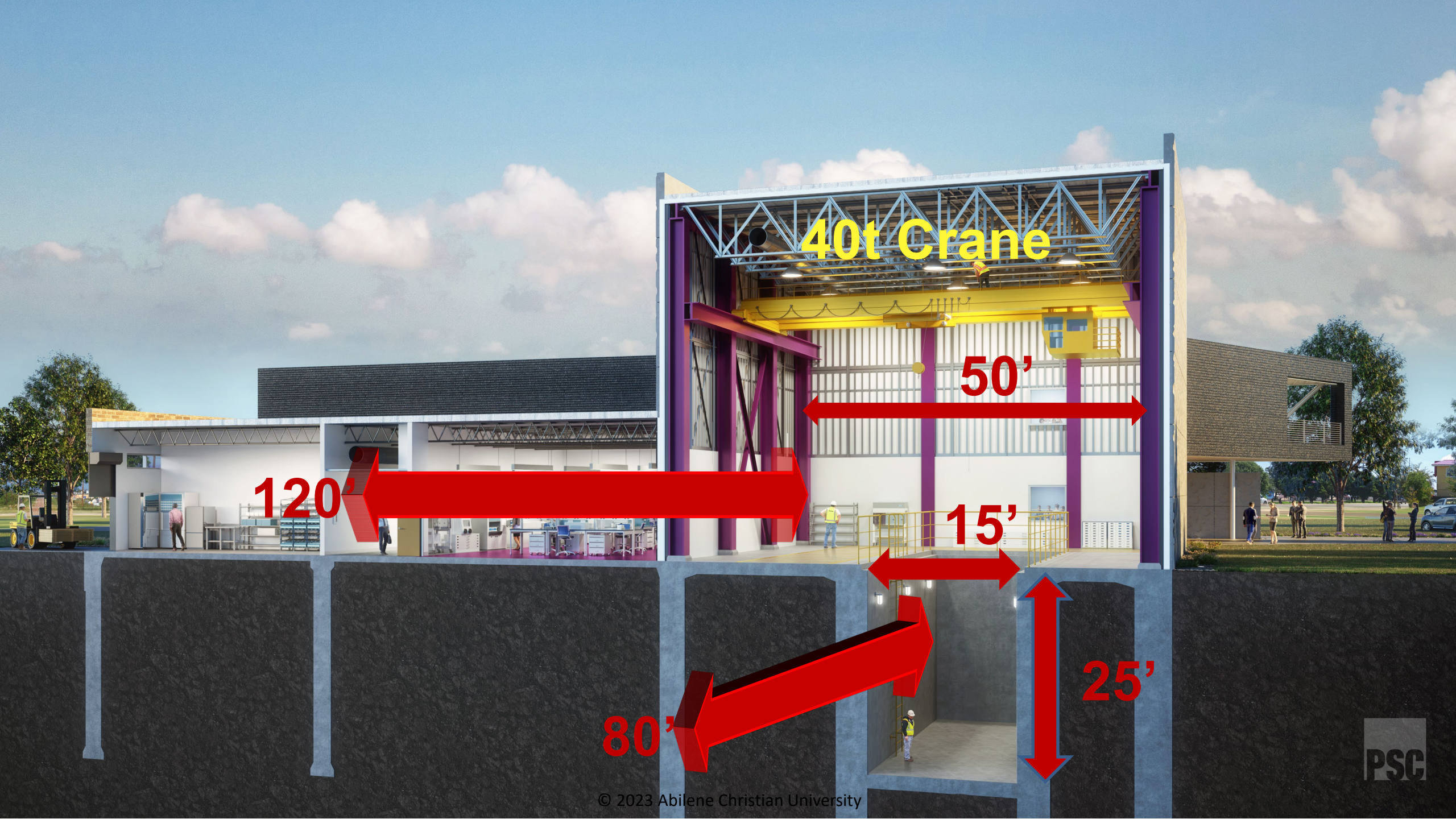


Science and Engineering Research Center

- 28,000 ft² facility
 - 6,000 ft² Research Bay
 - Specialty Research Labs
 - Offices
- Design completed by Parkhill
- Linbeck construction company
- Design Completed: 2021
- Begin Construction: 2022
- Completed: 2023







40t Crane

50'

120'

15'

25'

80'











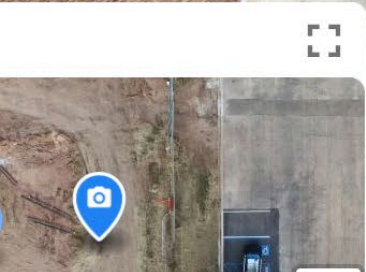




Figure 12A-2 MSRR Site Layout

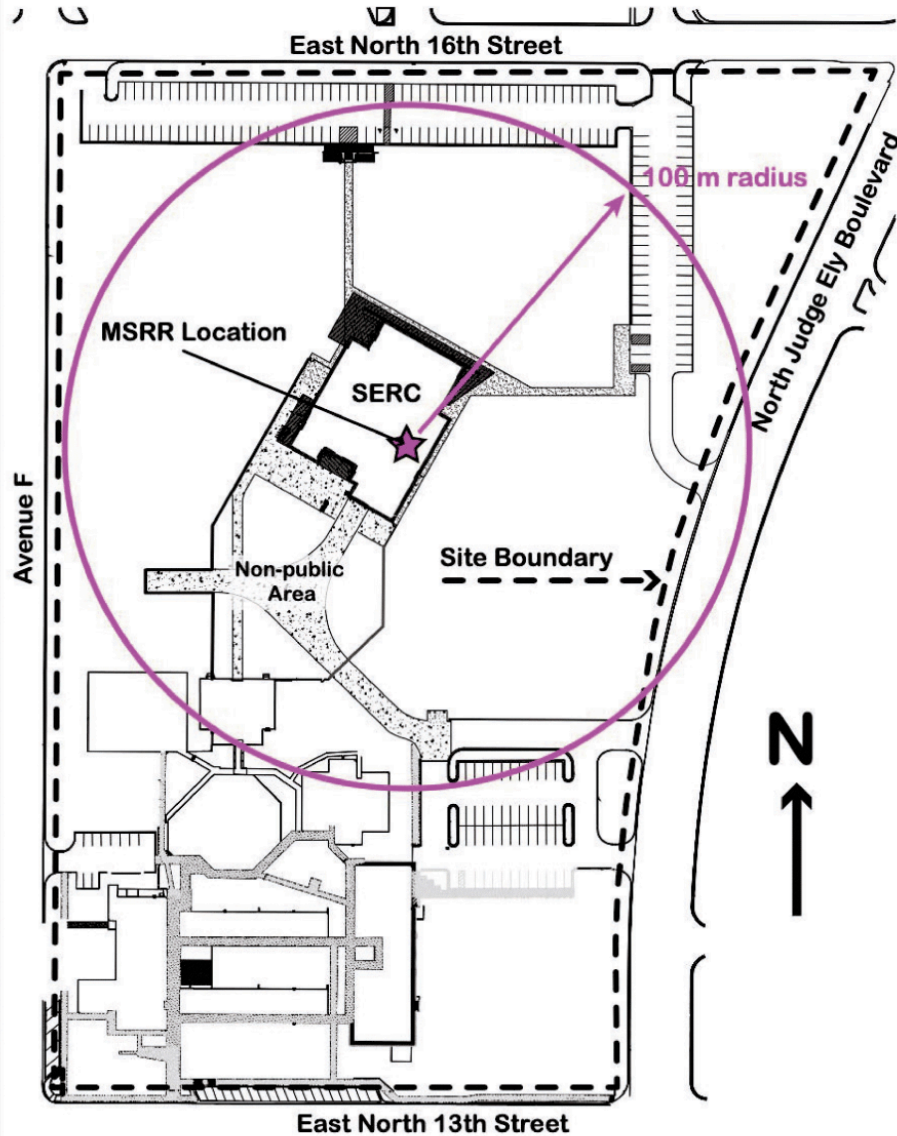
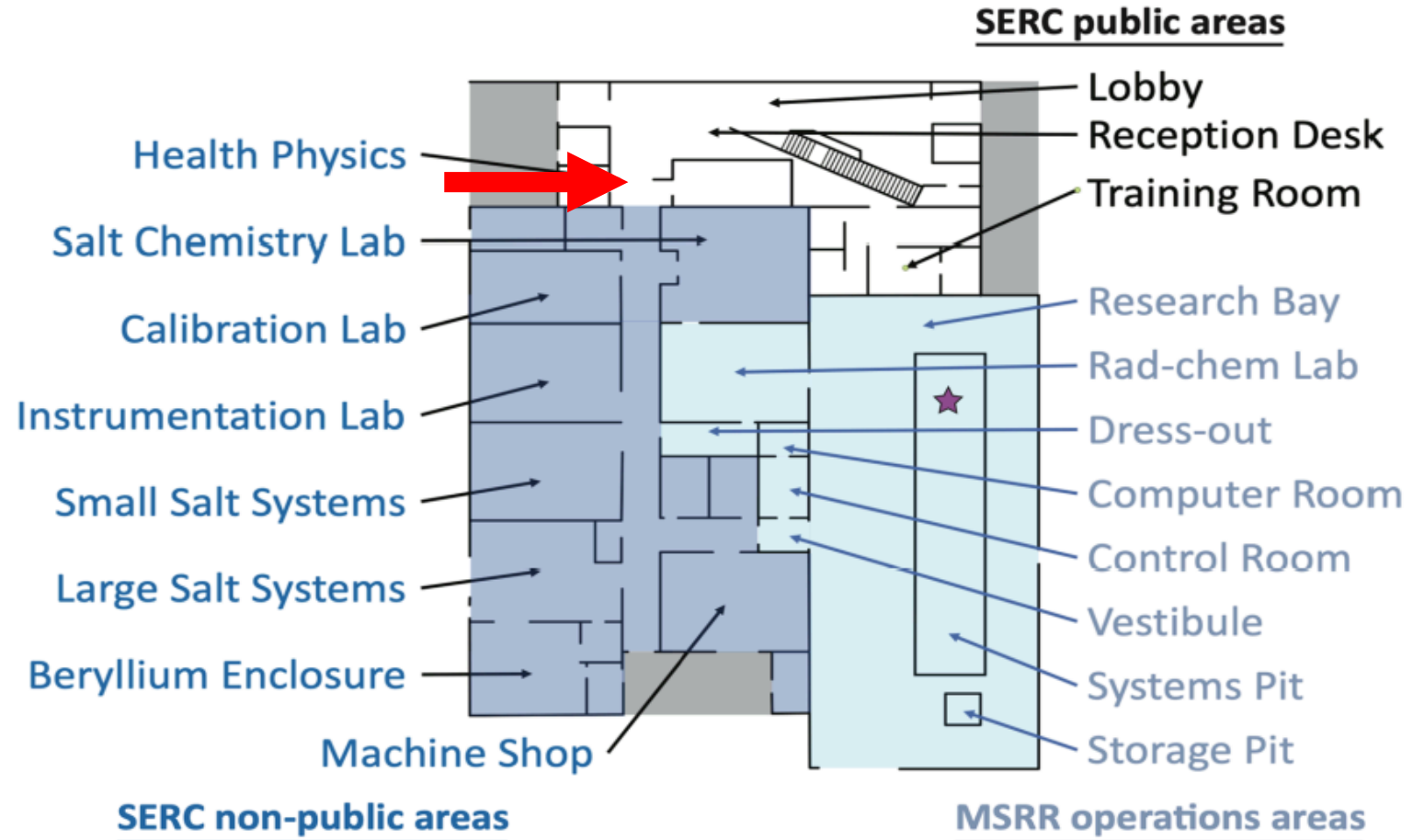


Figure 19.4-2 Science and Engineering Research Center First Floor Layout





Full-service law enforcement agency

- 24/7/365 operations
- 14 Full-time Police Officers/6 Civilian Staff
- All ACUPD officers are fully certified/armed Texas police officers
- Formal Working Agreement w/ Abilene Police Dept.
 - Joint 800 MHz radios system/dispatch
 - Full jurisdiction on/off-campus
- Primary Response 24/7 to area Alarms
- Close working relationship with local, State DPS, FBI

ACU Police Department



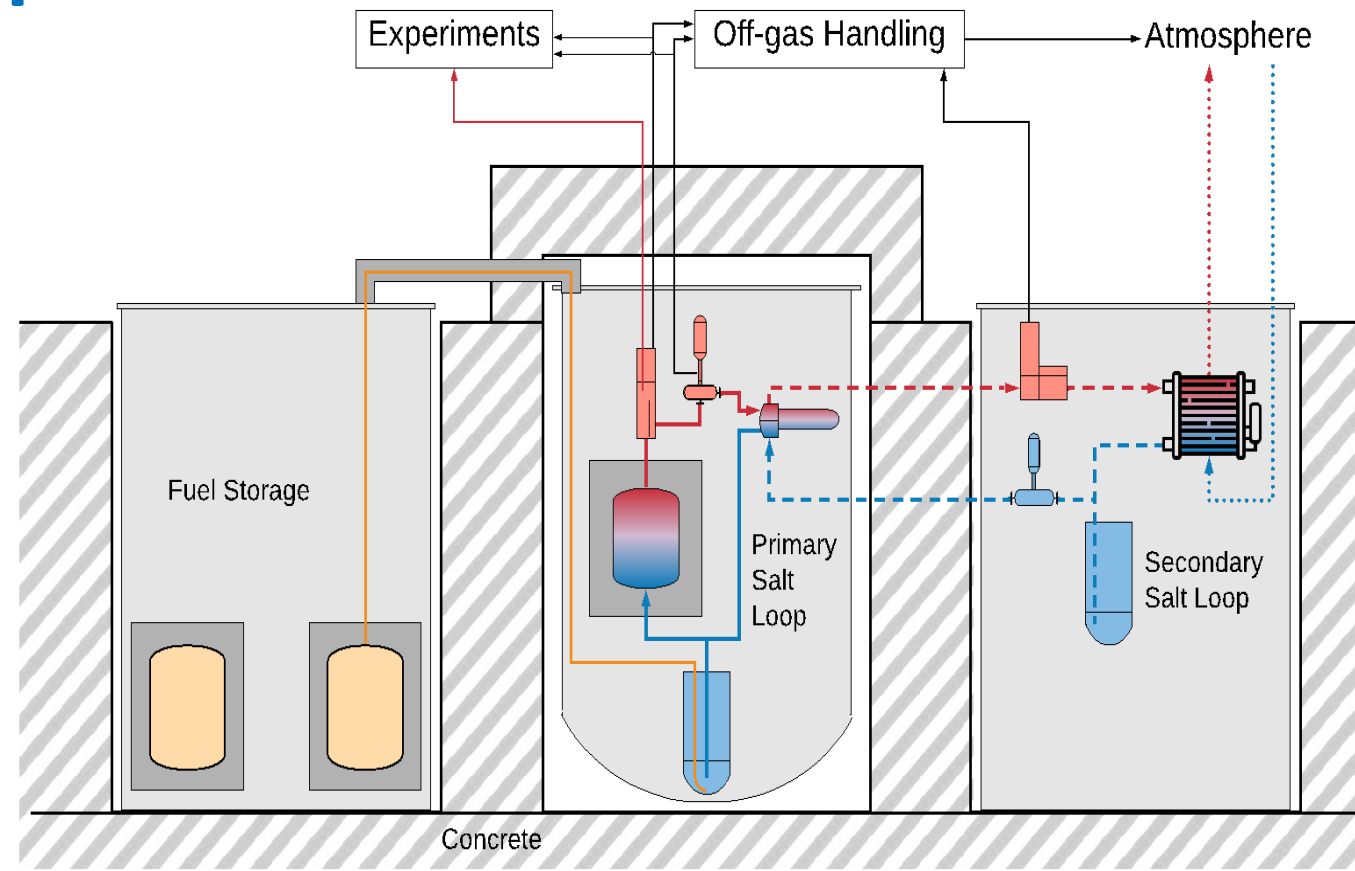
City of Abilene Police Department



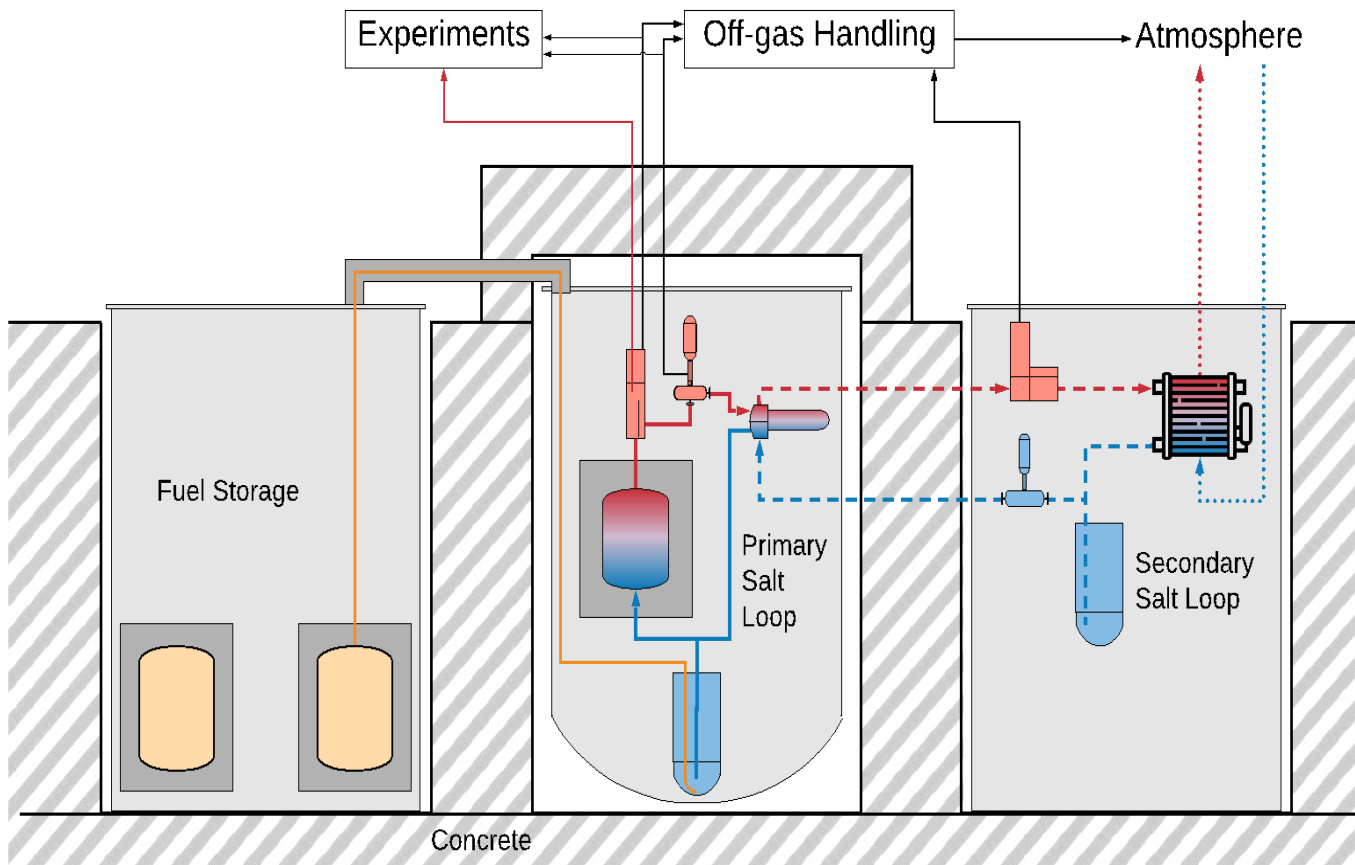
- 287 Combined (Sworn & Civilian)
- Recognized Agency- Texas Police Chiefs Association
- Event Response:
 - Co-Jurisdiction with ACUPD
 - Backup for Alarm Response Procedure
- Formal Joint-operations Agreement w/ ACUPD
- Close relationship/Info Sharing with all local, State, and federal agencies

MSRR Design Features: Fuel

- Special Nuclear Material (SNM)
 - Anticipated SNM license inventory:
 - 500 kg U
 - HALUE (enrichment less than 20%)
 - Small Unirradiated SNM inventory after initial startup:
 - Physical Form of SNM



MSRR Design Features: Facility



- Facility security
 - Barriers to access:
 - Access control
 - Intrusion detectors
 - Alarmed response
 - Containment of SNM/fission products:
 - Multiple barriers
 - Salt
 - Primary Salt Loop
 - Reactor Enclosure
 - Massive shielding
 - Off Gas System
- Physical protection of shipments of SNM
- Information Technology Security (Cybersecurity)

THANK YOU

acunextlab.org

