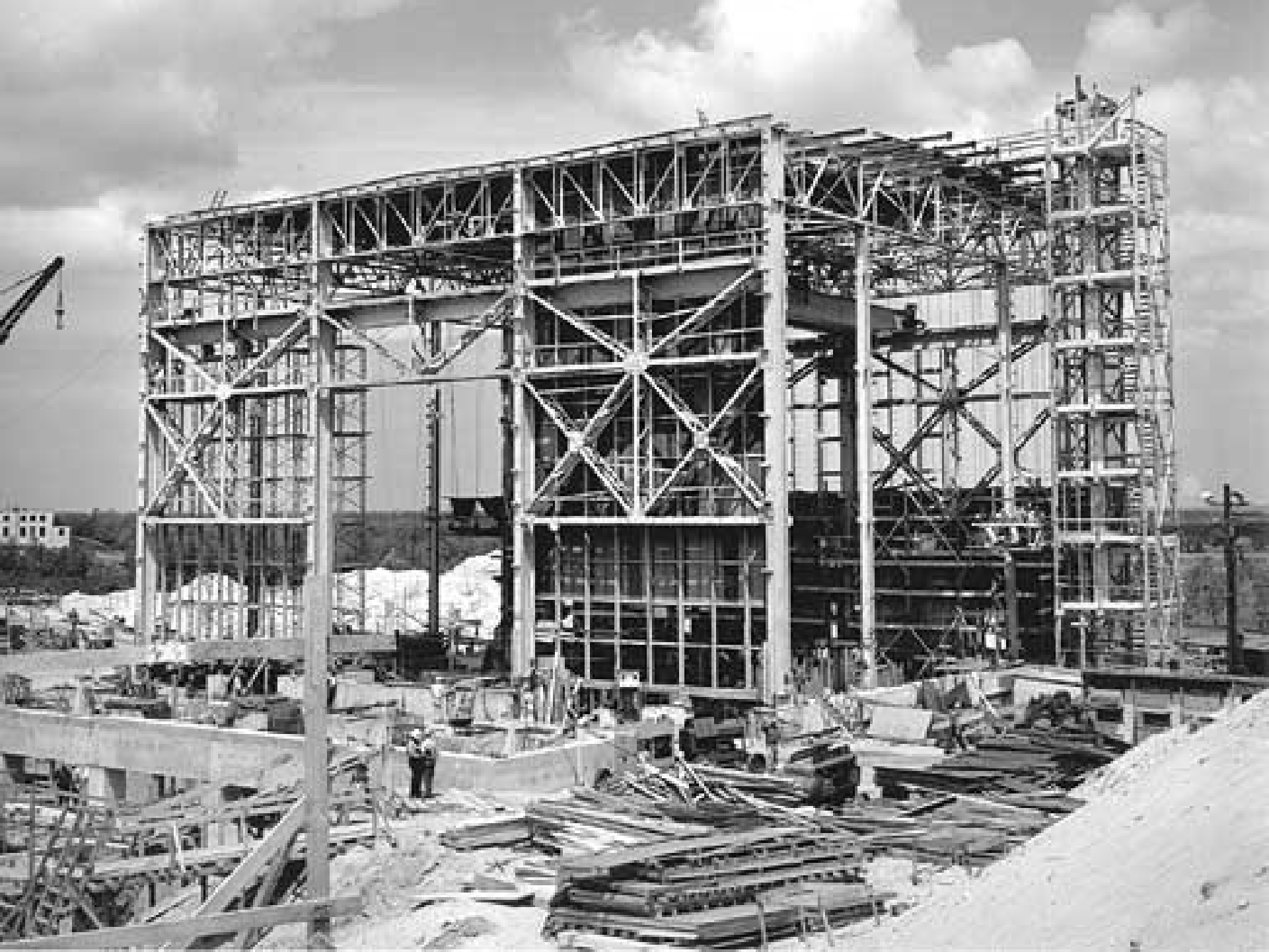


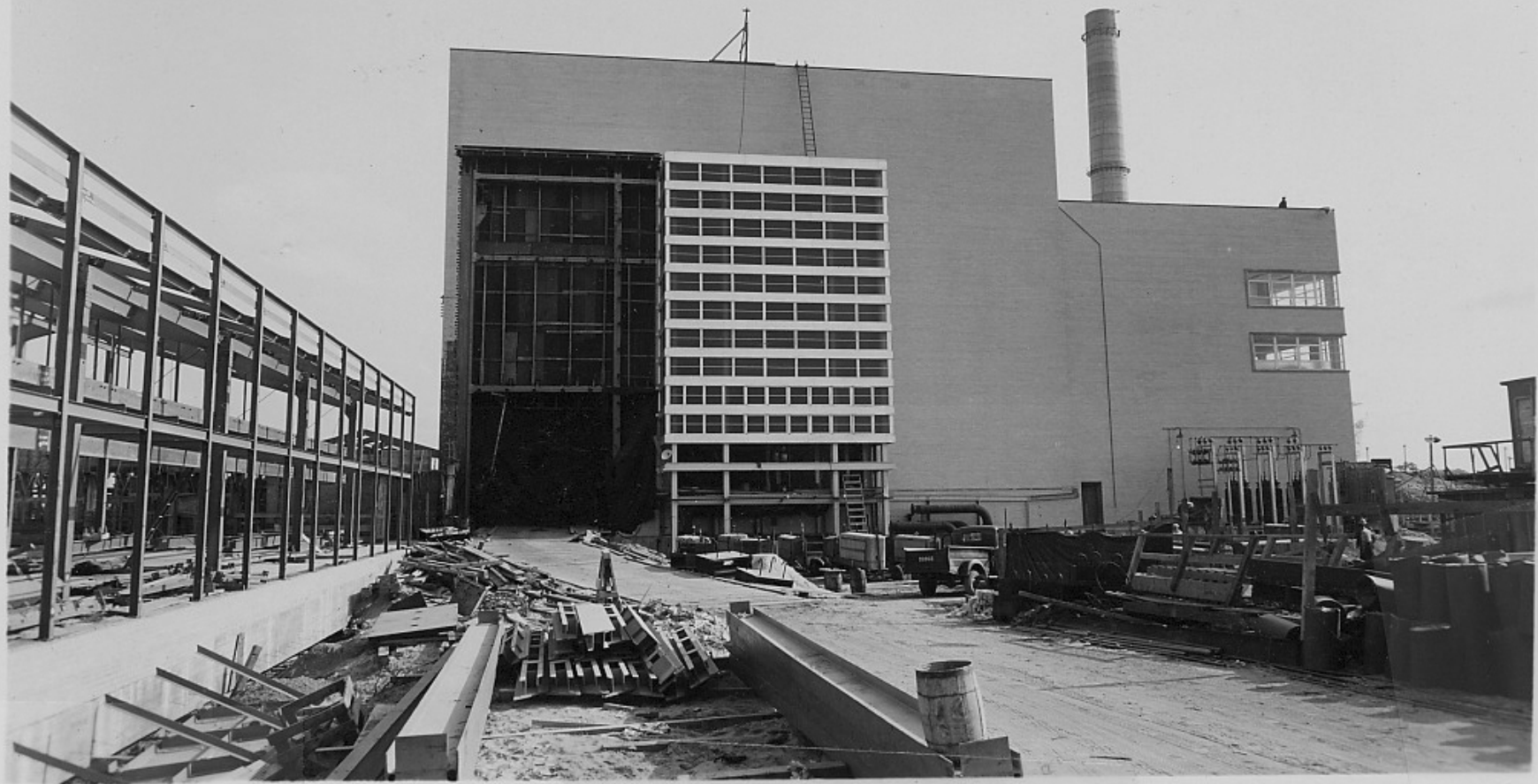
An EPHA for a D&D Operation at Brookhaven National Laboratory

*John Searing, BNL
Terry Brog, AlphaTRAC
05/07/2007*





~~RESTRICTED~~



11-2-48

Pile Building and Pile Laboratory Construction Looking East

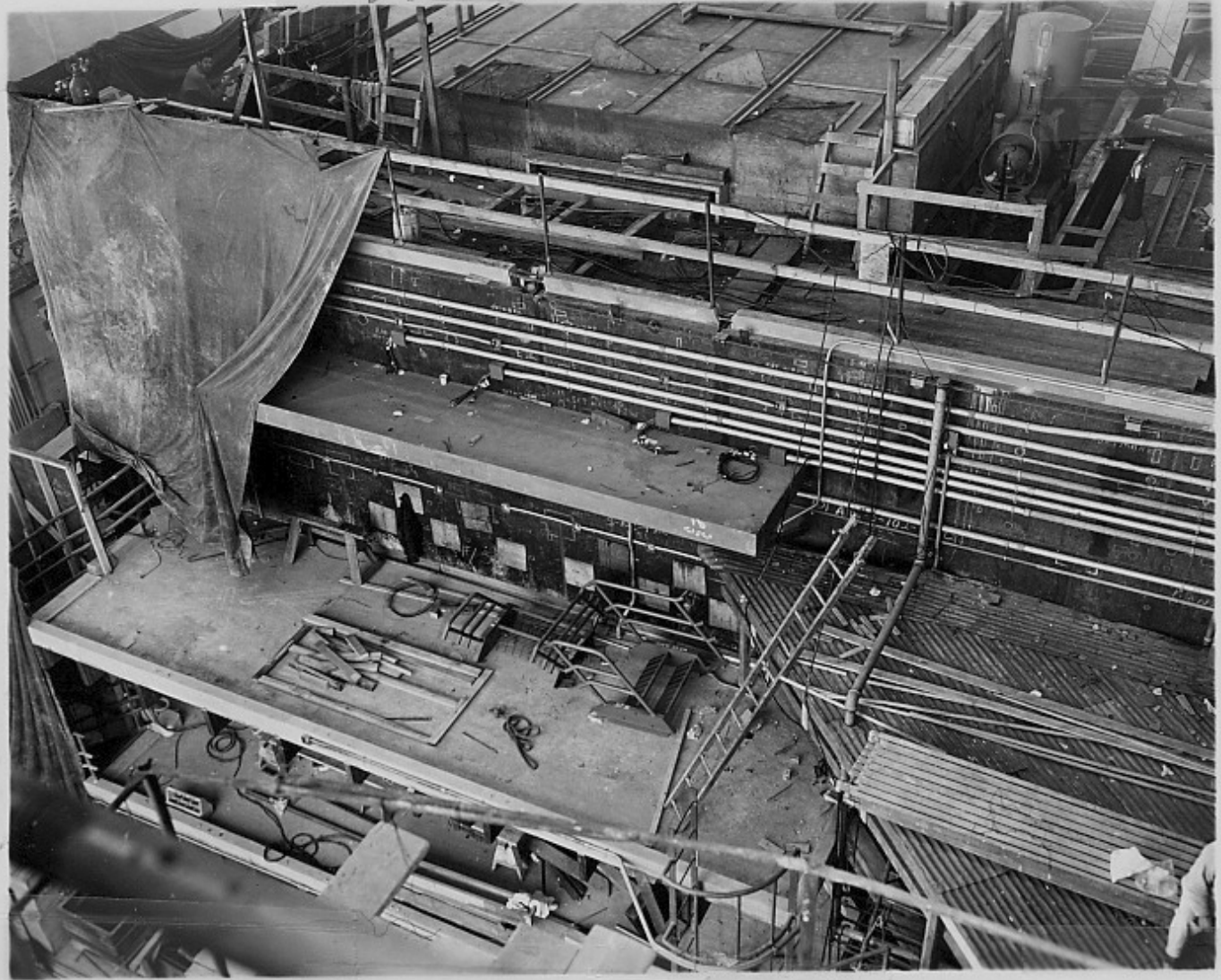
All-4-8



EMERGENCY
MANAGEMENT
ROUND

EXPECT THE UNEXPECTED

RESTRICTED



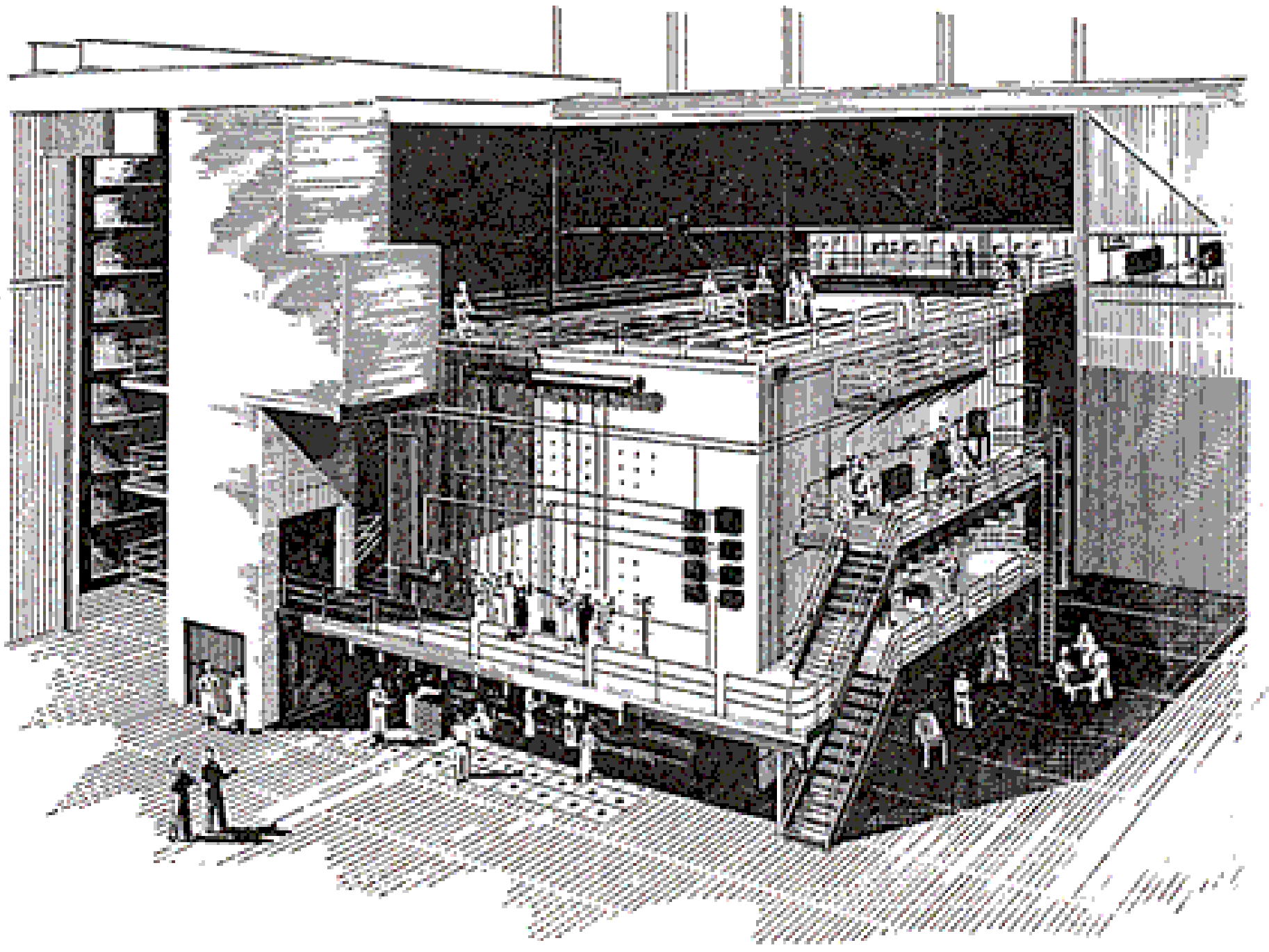
1/13/49

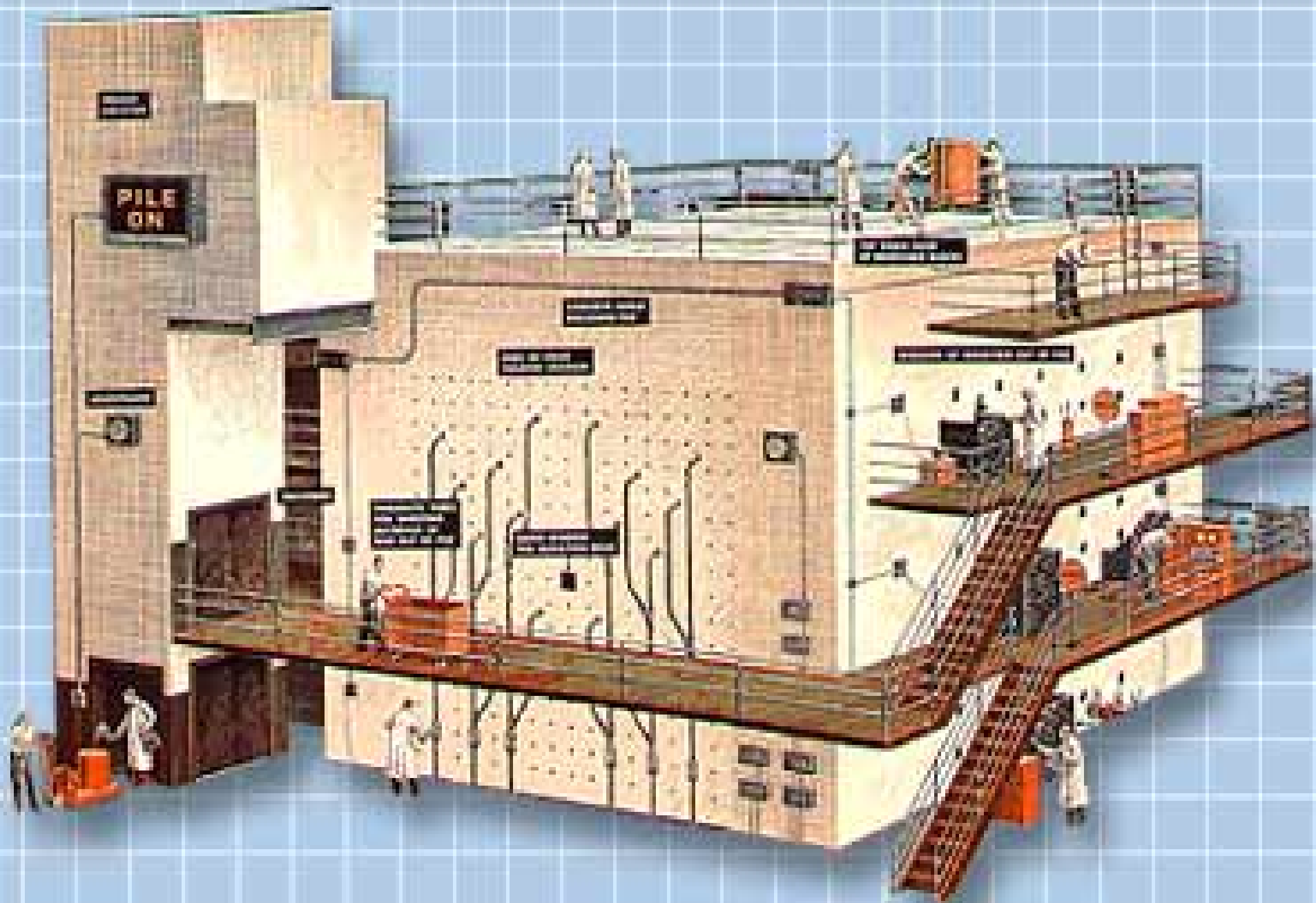
A1-16-9

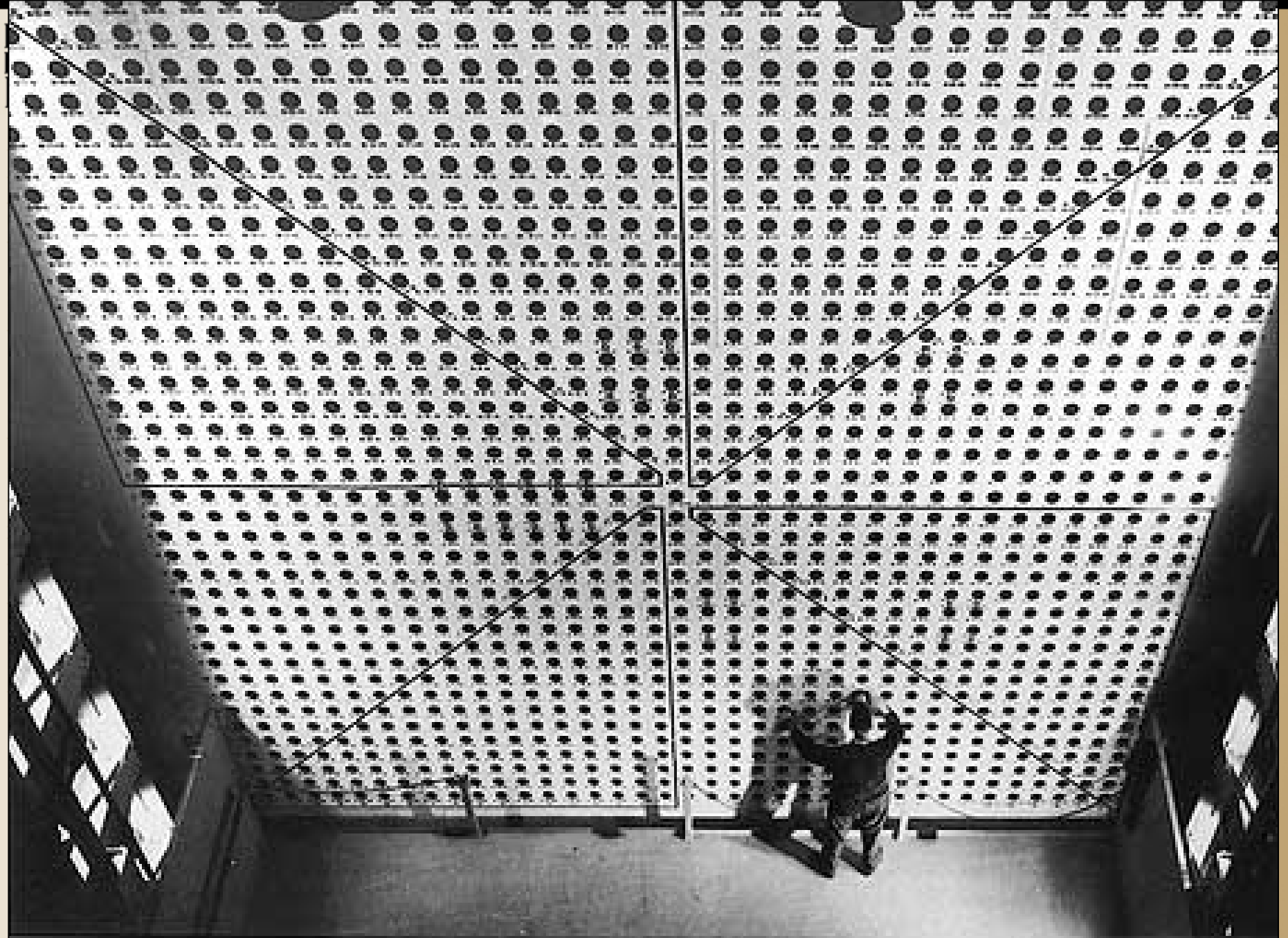
West Face of Pile Showing Temporary Roof Enclosure
and Balcony Erection

August 21, 1950



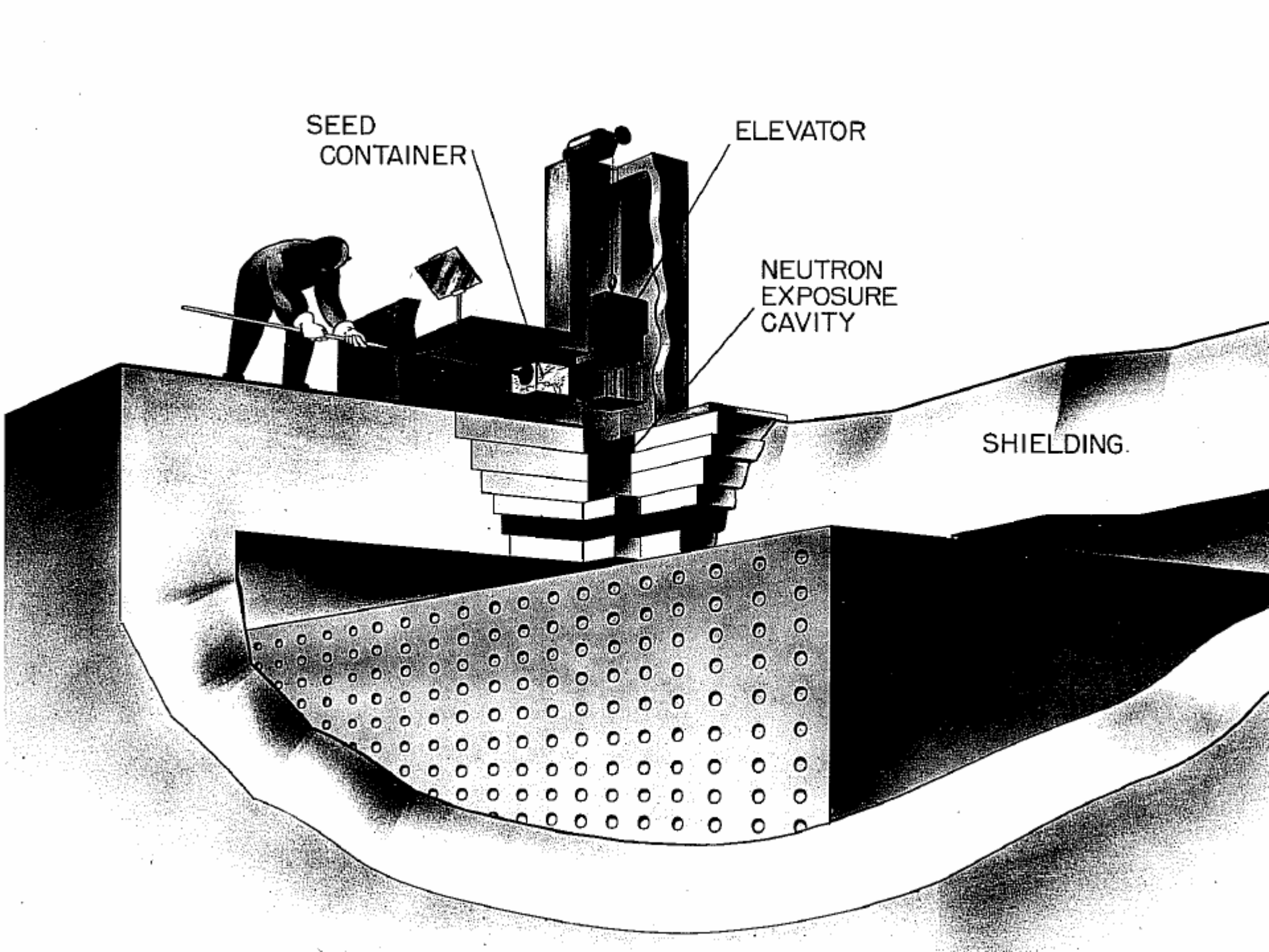






Loading face of the Brookhaven Graphite Research Reactor.





SEED
CONTAINER

ELEVATOR

NEUTRON
EXPOSURE
CAVITY

SHIELDING.

Background

- Brookhaven Graphite Research Reactor operated from 1950 to 1959
- Graphite-moderated research reactor
- 25-foot cube of 60,000 blocks of graphite
- Blocks are 10 cm by 10 cm by various lengths
- C-14 is dominant radionuclide
- Ni-63, H-3, Eu-152 in significant quantities
- Several other radionuclides present



Background

- Temporary contamination control enclosure used during block removal
- Blocks will be removed from pile and placed in supersacks
- Supersacks loaded into IP-1 boxes
- IP-1 boxes loaded onto trucks
- Trucks transport contents to HWMF



Methodology

- Materials screen out based on hazards screening criteria (non-dispersible)
- Abbreviated hazards assessment performed to validate screening (no consequences beyond 30 meters) used in hazards survey



Methodology

- Events
 - Spill involving breach of supersack
 - Small fire involving breach of supersack
 - Explosion involving 3 IP-1 containers
 - Small aircraft involving graphite pile
 - Large aircraft involving graphite pile



Methodology

- Hotspot Model (2.06)
 - Standard terrain
 - Moderately stable weather (F)
 - Wind speed of 1 m/s
 - Inversion mixing height of 300 m
 - Four days of ground shine



Results

- Spill of one supersack
 - PAC (1 Rem) is not exceeded at 30 m
- Small fire involving one supersack
 - PAC (1 Rem) is not exceeded at 30 m
- Small aircraft crash
 - PAC (1 Rem) is not exceeded at 30 m
- Large aircraft crash
 - PAC (1 Rem) is not exceeded at 30 m



Additional Work to be Completed

- Transportation Events
 - Full truck loads
 - Evaluate routes to waste facility
- Hazardous Waste Management Facility
 - Different planning quantities and mitigation
 - Evaluated with other waste inventories
- Enhanced Local Emergency Plan for the facility
 - Site-wide plan does not cover removal activities
 - Existing LEP does not cover removal activities



DSA/EPHA Comparison

- Conclusions differ
 - DSA identifies impact at 100 m
 - EPHA identifies no consequences at 30 m
- Differences lie in defined approach
 - DSA uses bounding credible event
 - EPHA uses maximum plausible event



Conclusions

- Controlled removal process is not consequential
- Differences between DSA and EPHA exist but are explainable
- Enhanced LEP addresses DOE concerns about site-wide EP and existing facility EP



Acknowledgement

Project funded by
Brookhaven National Laboratory

