-----Original Message-----
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Proposed Modern Radiological Science Complex Los Alamos

Proposed Modern Radiological Science Complex

Presentation to the Senior Advisory Group
Feb 26, 2004

Radiological Facilities Planning Group

D. Rusthoi, AFC-PO, Co-Chair
J. Retelle, MST-Div
J. Sprinkle, N-Div
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Radiological Facilities Planning Group

RFPG Members:

Thomas Meyer	ADSR (Champion)
Dana Christensen	ADSR (Champion)
Chris Webster	ADSR (Secretary)
Dan Rusthoi	AFC-PO (Co-Chair)
Mike Cappiello	AFC-PO (Co-Chair)
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Tom Granich	B-Div/FWO
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R. Sharp-Geiger	MST-OPS
Jim Sprinkle	N-1
Larry Ussery	N-2
Don Close	N-2
Eliud Vigil	NMT-DO
Steve Greene	P-DO
Kirt Anderson	PM-1
Melanee Shurter	RRES-ECO
Lisa Henne	RRES-ECO

Radiological Facilities Working Group

RFWG Members:

Dan Rusthoi	AFC-PO (Co-Chair)
Mike Cappiello	AFC-PO (Co-Chair)
Sandy Wagner	C-DO
John Retelle	MST-Div
Jim Sprinkle	NIS-Div
Carey Bare	IFC
Melanee Shurter	RRES-ECO

Existing Radiological Facilities are Aging

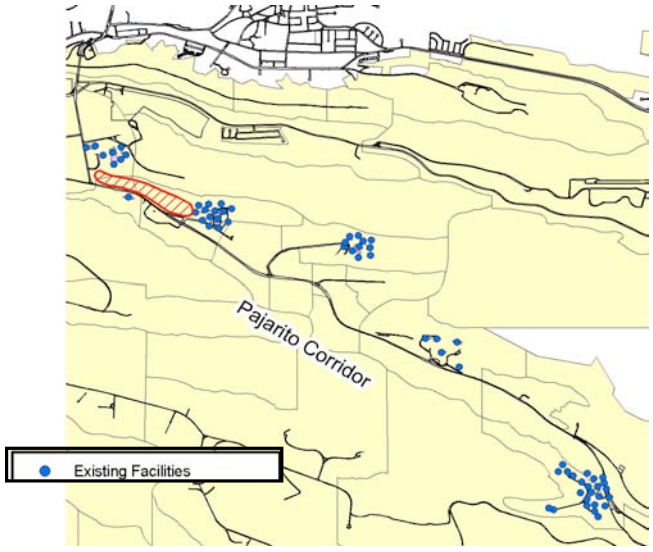
- **Nearly 70% of all LANL radiological facilities are 40-60 years old**
  - **Rapidly becoming obsolete and seriously deteriorating** *All of these facilities are"grandfathered" because of outdated building codes, safety and/or security requirements.*
- **O&M costs are escalating**
  - *SIGMA Bldg, for example, required over $5M/yr during the last three years.*
- **Upgrade costs to meet bldg codes, safety & security requirements are prohibitive (with limited lifespan)**
  - *Current estimate for MST's SIGMA bldg alone is over $100M*
  - *Estimate for N-Division's TA-35 bldgs (2 & 27) is $50-60M*
  - *C-Division's RC-1 Facility would require $40-50M*
- **Deferred maintenance is >$40M**

Initial Assessment Has Identified Facility Replacement Needs

Table I. Summary of LANL Radiological Facilities Proposed for Replacement

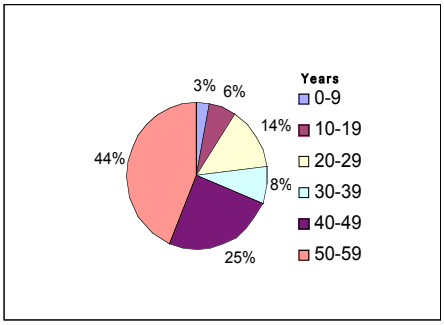
Division / Program	Structures / Space to be Vacated	Existing space proposed for replacement (gsf)	Predominant Condition Assessment	Predominant Building Age (years)	Deferred Maintenance for Affected Buildings
Chemistry	10 permanent bldgs 8 transportables 2 trailers	167,409	POOR to FAIL	40-59	$13,629,011
Mat'ls Science & Technology	7 permanent bldgs 2 trailers	266,154	POOR to FAIL	40-59	$18,957,662
Nuclear Non-proliferation	21 permanent bldgs 2 transportables 9 trailers, 3 "other"	155,419	POOR to FAIL	40-59	$6,856,268
Rad Machining / Inspection	1 permanent	29,365	ADEQUATE	40-59	$824,342
Other	Partial building space	1,375	N/A	40-59	N/A
TOTALS, gsf (gross sq. ft.)		**619,722**			**$40,267,283**

Rad Facilities Proposed for Replacement are Scattered Along the Pajarito Corridor



We are Targeting 80% of Existing Radiological Facilities for Replacement

- **Without facility replacement, LANL will systematically lose radiological competence and missions will not be met.**



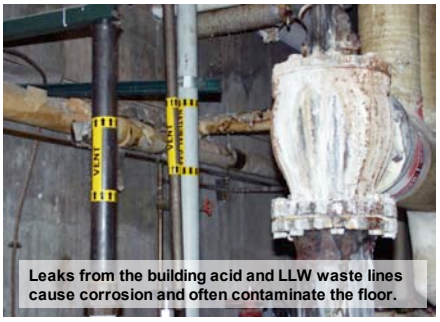
Age of Existing Radiological Facilities

Facility Deterioration is a Serious Issue

Insulation (asbestos & no-asbestos) on heating throughout facility needs maintenance.

To control the leak in this area, a bucket was placed under the leaking joint.

"Band aid" repairs - rusted ductwork repaired by spreading caulking to seal leaks



Leaks from the building acid and LLW waste lines cause corrosion and often contaminate the floor.

Facility Maintenance is a Serious Issue

Backdoor to RC-1

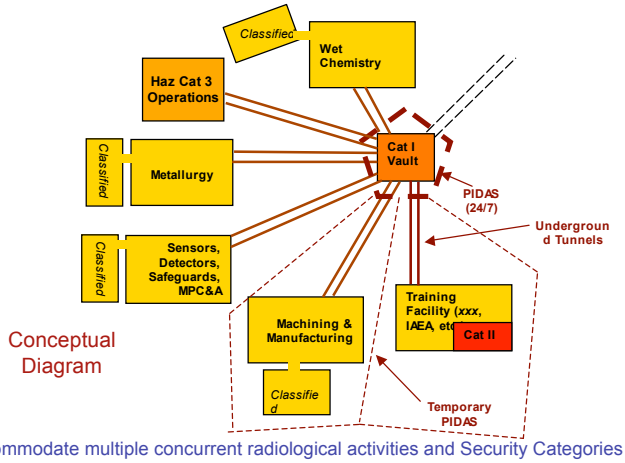
It is often difficult to meet current building codes when repairing old structures

During Cerro Grande fire, trailers at TA-35 were difficult to protect.

Trailers are expensive to maintain and often neglected.

Nice view, but difficult to protect, and at 15 yrs, near the end of its useful life.

LANL Proposes to Build a Modern Radiological Science Complex



Conceptual Diagram

- Accommodate multiple concurrent radiological activities and Security Categories (III and IV)
- Include temporary accommodations for Security Category II IAEA training schools
- Include Security Category I area capable of supporting specific (HEU) weapons assembly
- Include Hazard Category 3 areas for specific co-located C-Div/N-Div activities

A Modern Radiological Science Complex Would Greatly Enhance LANL Capabilities

- Complex would be designed to
  - meet current and future needs
  - be flexible and expandable
  - meet or exceed building codes, safety and security requirements
  - accommodate both classified and unclassified missions
  - accommodate SNM storage needs
  - minimize, perhaps eliminate, routine material transportation
  - accommodate collaborations / interactions with industry, universities, and foreign nationals
- Complex would greatly improve efficiency with proximity of labs, offices, SNM storage, and non-public roads or underground tunnels / rabbit systems for transport of materials
- Complex would eliminate deferred maintenance backlog ($40M), upgrades ($370M), lower O&M (several $M/yr), and reduced nuclear material transfer costs ($0.5M).

Proposed Radiological Complex Would Consolidate and Replace Older Facilities

- Complex would retire 65 of 81 current radiological facilities (80% of LANL total).
- The 65 deteriorating facilities planned for replacement are scattered over 5 technical areas.
- Initial estimates indicate replacement would consolidate ~620,000 ft^2. We are targeting consolidation for a footprint below 400,000 ft^2 (does not include anticipated program growth). Detailed estimates will be made to confirm consolidation numbers.
- D-Division has been asked to perform a business analysis (cost savings in consolidation, deferred maintenance, material transfer, upgrades, and O&M).

Important National Security Missions are Conducted in our Radiological Facilities

- **Nuclear Weapons -** Weapons radiochemistry, bioassay analyses, materials performance prediction, modeling confirmation, test readiness, experimental detectors and sensors, device components, nuclear emergency response, nuclear physics.
- **Nuclear Non-Proliferation and Arms Control -** Non-destructive assay, materials control and accountability, sensors and detectors, radiochemistry and attribution analysis, diagnostics, intrinsic and extrinsic safeguards.
- **Homeland Security -** Advanced detectors and sensors, emergency response equipment, event reconstruction, border protection systems, infrastructure diagnosis and protection systems, materials separation, predetonation attribution.

Important Non-Weapons Missions are also Conducted in our Radiological Facilities

- **Nuclear Energy**
- **Waste Management**
- **Environmental Management**
- **Nuclear Regulation**
- **Health and Safety**
- **Science**

National Security and Science Missions are at Risk

- *Attribution analyses of domestic and international nuclear events*
- *Enhanced Surveillance Program (stockpile reliability) R&D*
- *Joint Test Assembly (weapons mockups)*
- *Stockpile stewardship hydrodynamic test units (replacing underground testing)*
- *R&D on indoor/outdoor radiation portal monitors and vehicle radiation monitors*
- *2-4 International training schools per year (every IAEA inspector for the past 25 years has been trained at Los Alamos)*
- *3-6 Domestic training schools per year*

Radiological Complex: Next Immediate Steps

- **RFPG Working Group is walking the spaces**
- **Business Case Analysis has been requested (D-Division)**
- **Initial Security Analysis has been initiated (S-Division)**
- **Initial Mission Needs Analysis is in progress**
- **Initial Safety and Environmental assessments to be initiated shortly**

Artist's Conception of the Los Alamos Proposed Modern Radiological Science Complex

Complex is shown at the eastern edge of TA-48, adjacent to the existing PIDAS (next two pages show details of this strawman layout)

Division Headquarters

35,000 sq. ft. 2 story (1)

45,000 sq. ft. 3 story (2)

30,000 sq. ft. 2 story (3)

30,000 sq. ft. 2 story (4)

Haz Cat 10,000 sq. ft. 1 story (12)

Approx. 60,000 sq. ft. 2 story (5)

30,000 sq. ft. 2 story (6)

40,000 sq. ft. 3 story (7)

30,000 sq. ft. 2 story (13)

30,000 sq. ft. 2 story (14)

45,000 sq. ft. 3 story (8)

40,000 sq. ft. 3 story (9)

Hot Cell 15,000 sq. ft. 1 story (11)

9,000 sq. ft. (10a)

24,000 sq. ft. 2 story with vault basement (10b)

45,000 sq. ft.

87,000 sq. ft.

Security Fencing

TA - 48

TA - 55

Pajarito Road

TA - 48

TA - 64

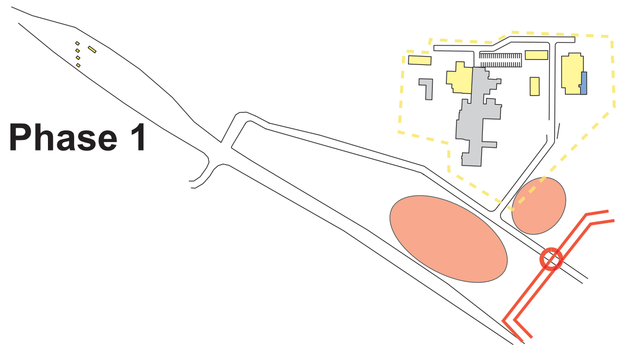
Possible PIDAS Expansion

Possible Developable Areas

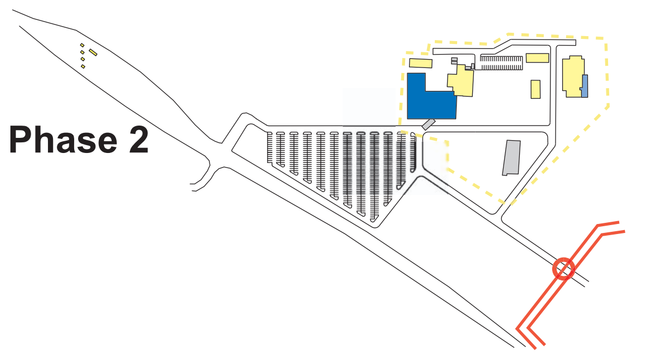
Existing PIDAS Boundary

Phasing Diagrams

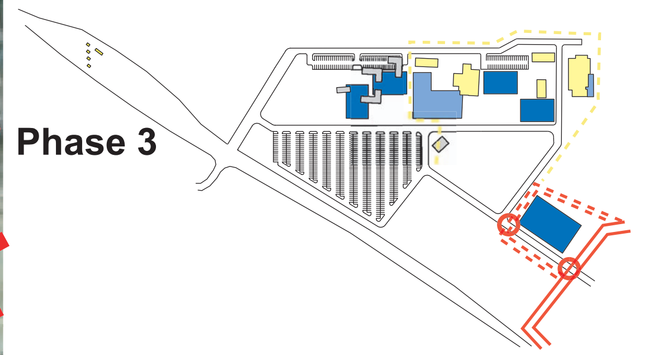
Phase 1



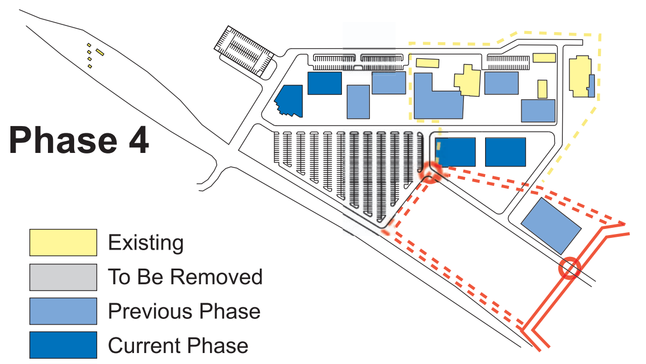
Phase 2



Phase 3

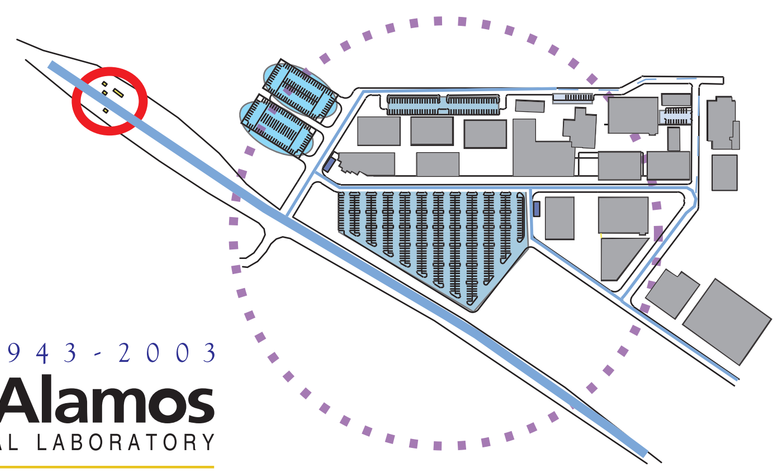


Phase 4

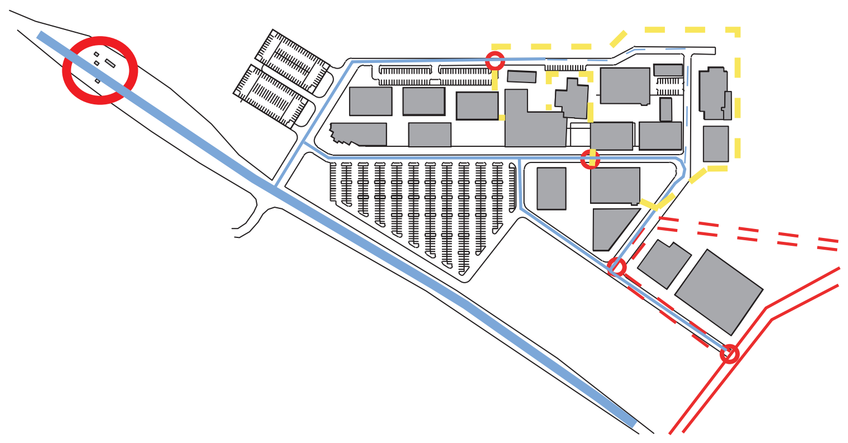


- Existing
- To Be Removed
- Previous Phase
- Current Phase
- Temporary Use Area
- Possible Developable Area

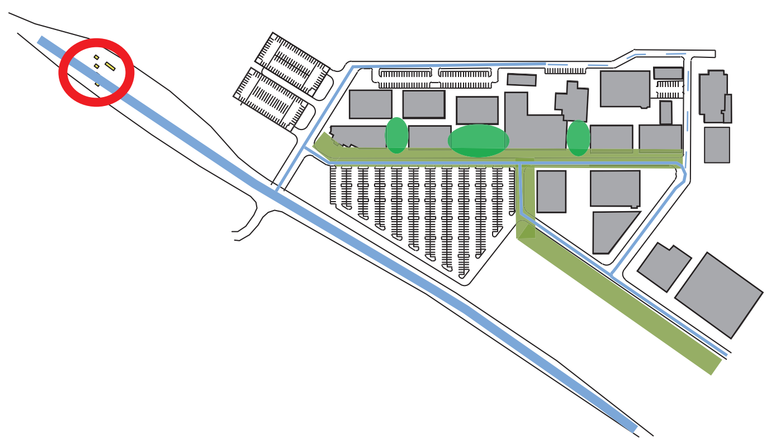
Parking & Road Network



Security Diagram



Pedestrian & Open Space



Legend

- Pedestrian Corridor
- Open Space
- Shuttle Stop
- Security Gate
- Security Fence
- Existing PIDAS Boundary
- Possible PIDAS Boundary
- Underground Tunnel

TA-48 Conceptual Master Plan Concept 1

DESIGNWORKSHOP
Landscape Architecture • Land Planning • Urban Design • Tourism Planning
506 Agua Fria • Santa Fe, NM 87501 • 505-982-8399 Facsimile 505-986-1396

21 July 2004

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Proposed Radiological Science Complex at TA-48

Bldg No. (from western-most corner)	Class / Unclassified	Lab / Office	Occupants	Occ. Space (ft^2)	TOTAL Occ. Space (ft^2)	Notes
Bldg 1	U	Office	C, N, MST Division Offices	35,000	35,000	
Bldg 2	U	Lab	N MST	35,000 10,000	45,000	
Bldg 3	U	Lab	C MST AFC B	15,000 10,000 4,000 1,000	30,000	
Bldg 4	Cl	Lab	MST	30,000	30,000	
Bldg 5A 5B	Cl Uncl	Lab Lab	C C	10,000 50,000	60,000	Need Classified portion of bldg
Bldg 6	Cl	Lab	MST	30,000	30,000	
Bldg 7	Cl	Office	N C MST	12,000 8,000 20,000	40,000	
Bldg 8	Uncl	Office	N MST AFC	24,000 17,000 4,000	45,000	
Bldg 9	Cl	Lab	N AFC	37,000 3,000	40,000	
Bldg 10A 10B	Uncl Cl	Lab Lab	IAEA Training School Rad Machining & Vault	9,000 24,000	33,000	Break into 2 bldgs - Inside PIDAS
Bldg 11	Uncl	Hot Cells	Multi-Divisional - CMR Hot Cells Replacement	15,000	15,000	
Bldg 12	Uncl	Lab	Multi-Divisional - Haz Cat 3 Operations	10,000	10,000	
Bldg 13	Cl	Lab	MST	30,000	30,000	
TOTALS		**3 Office Bldgs** **9 Lab Bldgs** **1 Hotcell Bldg**	**Office Space Total:** **Lab Space Total:** **Hot Cell Rpcmt Total:**	**120,000** **308,000** **15,000**		

Additional Notes: *This is a 'strawman' layout, projecting current space needs of the major Divisions. A number of the proposed buildings could be combined, reducing cost of construction. When consolidation efforts between the Divisions are resumed, space needs will likely be less.*

Required Summary Description of Proposed Line Item Project, Documenting Connection between Project and Programmatic Drivers (submitted with FY05 TYCSP writeup)

FY05 TYCSP Line Item Projects – Programmatic Requirements Summary Questions[1]

1. What are the specific program requirements that the project must meet?
   The Laboratory's mission is national security. To ensure national security in the area of nuclear technology and applications, the Laboratory relies on radiological facilities to perform the necessary research. These missions include (but are not limited to) support for weapons manufacturing, material-property evaluations for stockpile stewardship, support for domestic and international safeguards, training for IAEA inspectors, training and support for national emergency response to threats involving radioactive sources, biological research, detection and sensor technologies, various chemistry and chemical engineering missions, radioisotope production and distribution, and basic energy science.

2. How were the program requirements identified or derived?
   The above-listed programs are currently funded by the National Nuclear Security Administration (NNSA), the Department of Energy (DOE), the Department of Defense (DoD), etc.; strategic plans prepared by C-, N-, and MST-Divisions identify these programs and the facilities.

3. What are the critical assumptions, constraints and interfaces that bear on the program requirements and project development?
   It is assumed that national priorities will continue to prescribe the Laboratory's primary mission to be that of national security, and that the DOE/NNSA and DoD will continue to sponsor programs and charge the Laboratory with applying science and technology to address critical national security issues. It is also assumed that the Laboratory will not be able to continue its national security mission without functioning facilities capable of research and development with nuclear materials.

4. Are program requirements expected to change or be impacted by upcoming activities, decisions etc.?
   Program requirements continually change, especially those programs that are related to homeland security, non-proliferation, global terrorism, and national security needs, all of which are part of the above-listed programs.

5. What are the impacts to the program if the project is not completed as requested?
   If deteriorating radiological facilities are not replaced, the impact will be to eventually curtail production, operation, and R&D for the aforementioned missions. This condition is unacceptable in the national security interest.

6. What alternatives could be pursued to meet the program needs and why are they not being pursued?
   One alternative is to do nothing, and continue to use, maintain, and refurbish existing buildings, which is not only impractical, but more expensive and of extremely limited duration. Another alternative is to request facility replacement on a 'piece-meal' basis, losing the opportunity for a much more efficient and less costly consolidation effort.

[1] Source: NNSA FY05 TYCSP Guidance, January 2004