U.S. DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

PRESENTATION TO THE NUCLEAR WASTE TECHNICAL REVIEW BOARD

SUBJECT: REPOSITORY DESIGN ENHANCEMENTS

PRESENTER: DR. THOMAS E. BLEJWAS

PRESENTER'S TITLE AND ORGANIZATION: TECHNICAL PROJECT OFFICER, SANDIA NATIONAL LABORATORY ALBUQUERQUE, NEW MEXICO

PRESENTER'S TELEPHONE NUMBER: (505) 844-9160

OCTOBER 8 - 10, 1991

U.S. DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

PRESENTATION TO THE NUCLEAR WASTE TECHNICAL REVIEW BOARD

SUBJECT: REPOSITORY DESIGN ENHANCEMENTS

PRESENTER: DR. THOMAS E. BLEJWAS

PRESENTER'S TITLE AND ORGANIZATION: TECHNICAL PROJECT OFFICER, SANDIA NATIONAL LABORATORY ALBUQUERQUE, NEW MEXICO

PRESENTER'S TELEPHONE NUMBER: (505) 844-9160

OCTOBER 8 - 10, 1991

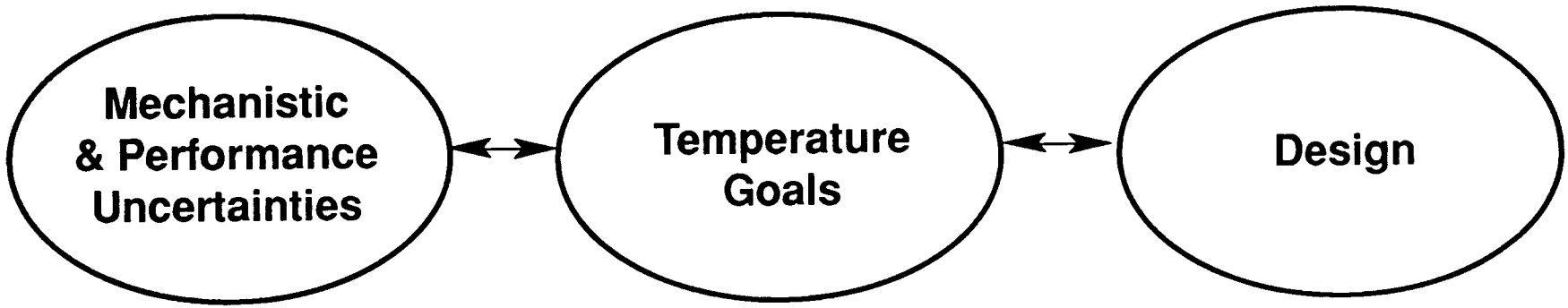
Outline

- Design goal
- Design trade-offs
- Plans
- Conclusion

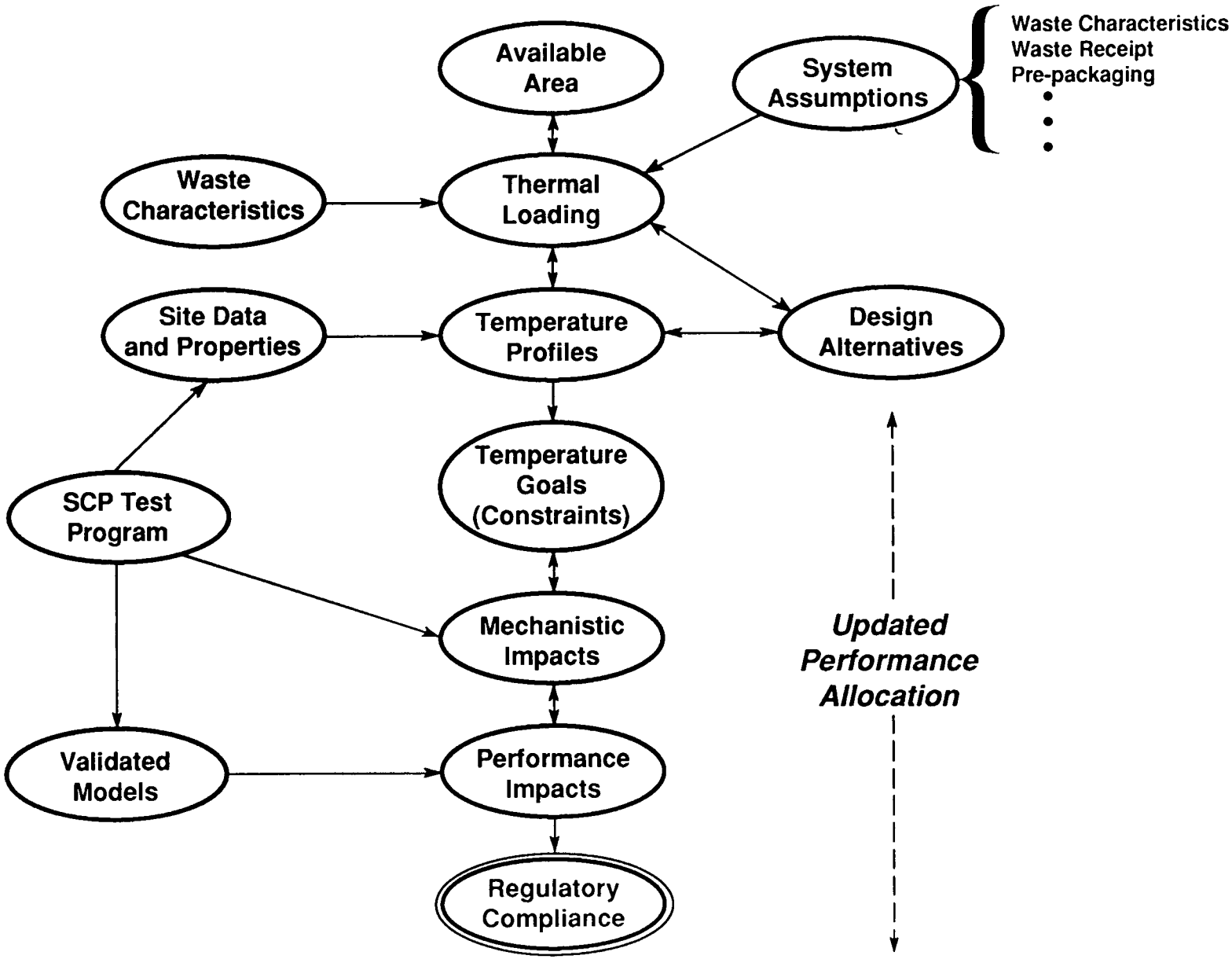
Design Goal

Design a repository system that meets performance objectives with an acceptable level of uncertainty

Uncertainties



Planned Approach



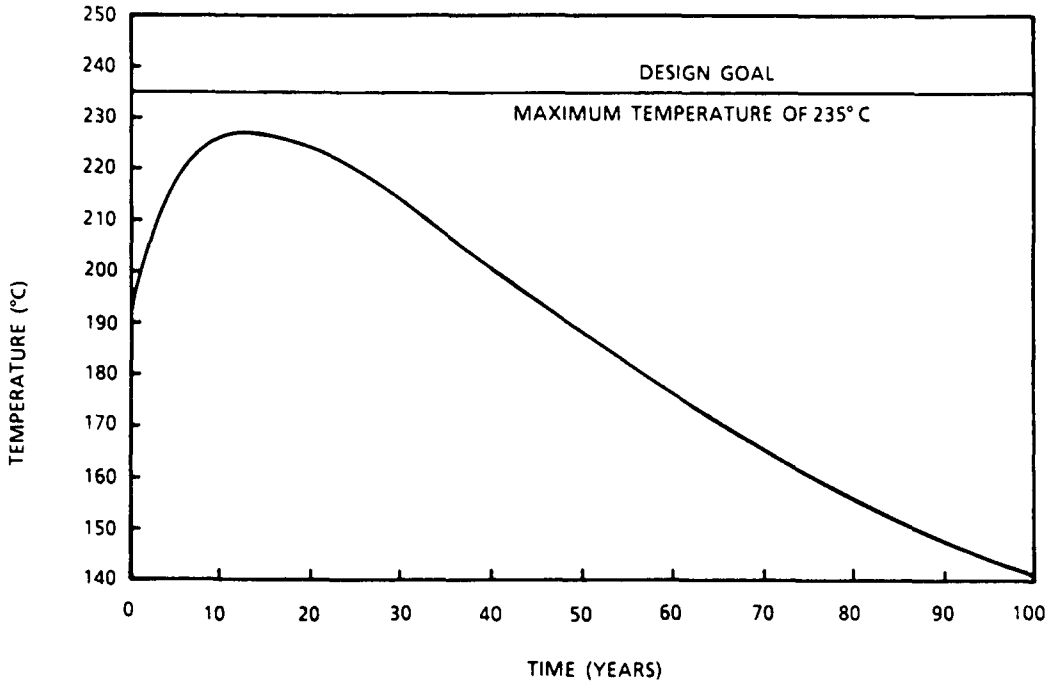
ORDETB5P.125.NWTRB/10-8/10-91

Design Trade-offs

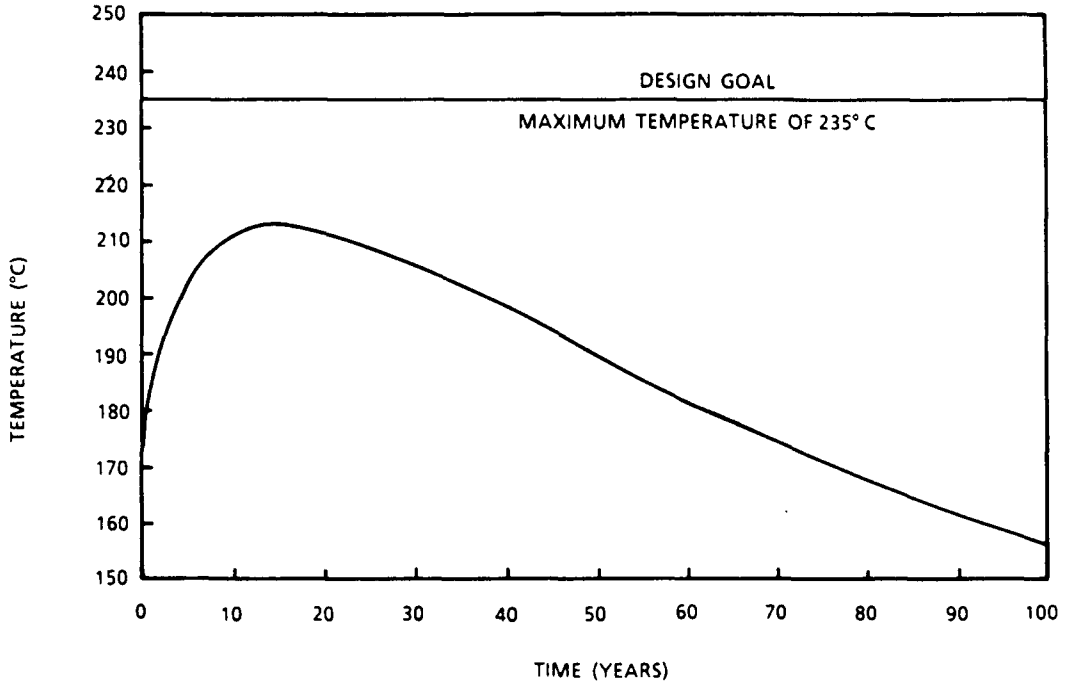
how much in package and spacing

Hotter	Design Elements	Colder
Larger waste volume in smaller area	Spacing (area-volume--flexibility)	Smaller waste volume in larger area
Early emplacement	Schedule	Delayed emplacement
Separate spent fuel and defense waste	Layout	Comingled waste
Limited ventilation	Ventilation	Extensive drift ventilation
Backfill early	Backfill	No backfill
⋮	⋮	⋮

Predicted Temperatures For Emplacement Boreholes



Borehole Wall Temperature - Vertical Emplacement

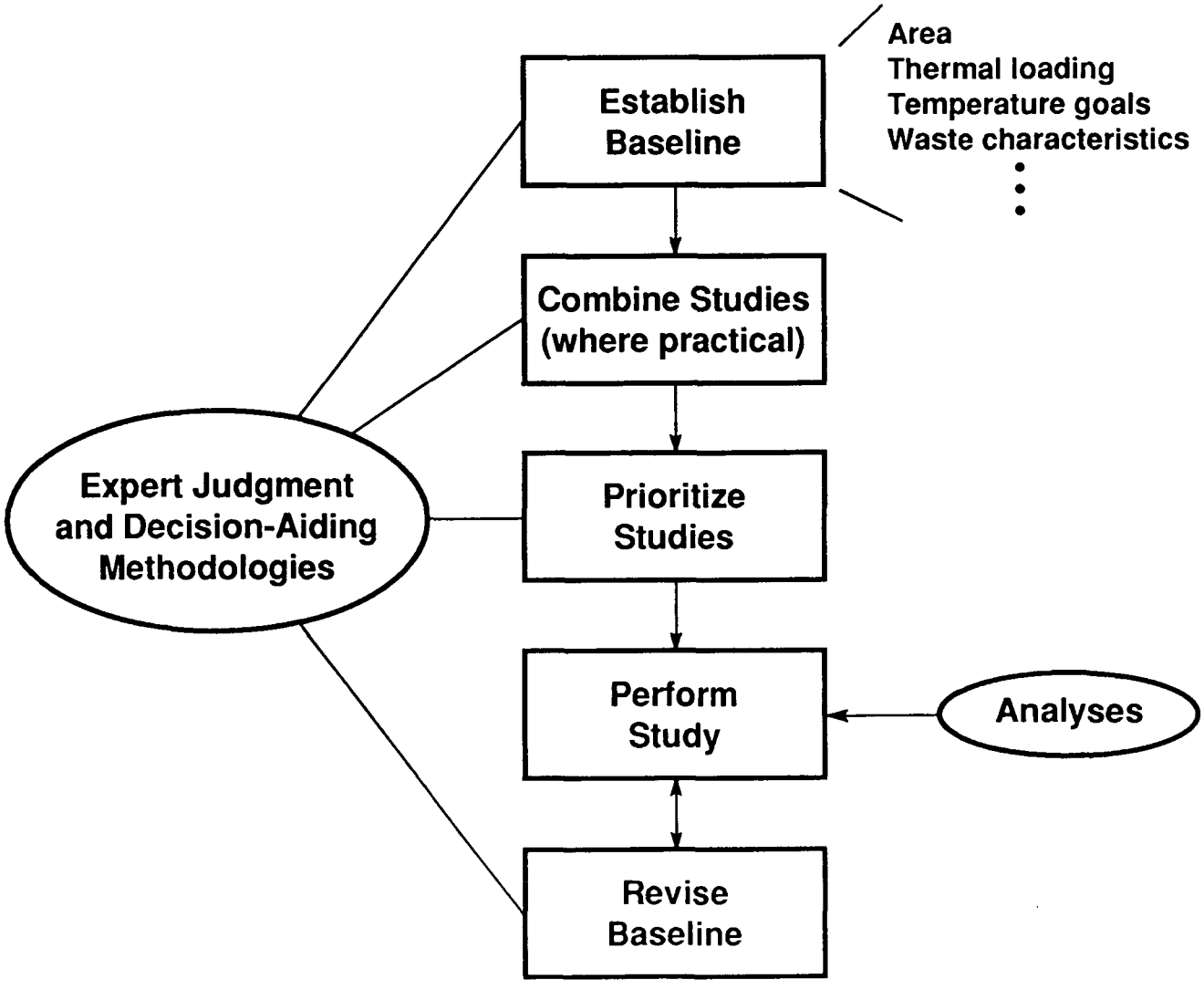


Borehole Wall Temperature - Horizontal Emplacement

Proposed Actions

- Perform mechanistic studies where appropriate
- Update temperature goals recognizing
  - Uncertainties in impacts & benefits
  - Prudence of early conservatism
  - Improved understanding of mechanisms
  - Improved performance models
- Develop boundaries of design alternatives
- Perform design studies

Design Studies



Conclusions

- Appropriate temperature constraints are necessary in the design process
- Design trade-offs will include consideration of (higher/lower) temperatures
- Trade-offs will be performed during ACD