Collaborative Research

DESIGN, CONSTRUCTION, MATERIALS AND WELDING

TECHNOLOGY TRACK OVERVIEW

Government & Industry Pipeline Research & Development Forum

22-24 March 2005

Houston TX

Major Technology Gaps

- **Strain Based Design**
  - Comprehensive set of tools with experimental validation
- High Strength Steels
- **Design & Construction**
  - Load prediction & limit state design methodologies
  - Integrity
- Materials Properties & Performance
  - Characterization methods & databases
  - Inspection
- Welding Development
- Coatings Development
- Implementation

PHMSA Joining Research Projects

- **VALIDATION AND DOCUMENTATION OF TENSILE STRAIN LIMIT DESIGN MODELS FOR PIPELINES**
- **PIPELINE INTEGRITY MANAGEMENT FOR GROUND MOVEMENT HAZARDS**
  - Recommended practices for integrity management
- **ULTRA-LOW FREQUENCY PIPE AND JOINT IMAGING SYSTEM**
- **DEFINE, OPTIMIZE AND VALIDATE DETECTION AND SIZING CAPABILITIES OF PHASED-ARRAY ULTRASONICS TO INSPECT ELECTROFUSION JOINTS IN POLYETHYLENE PIPES**

Collaborative Research

Effective Welding Development is Complex

- Maintenance, repair and alternative materials
- Many issues are interdependent
  - Design drives material requirements
  - Material performance constrains design alternatives
  - Welding development traditionally lags basic materials development
    - Tools, measurement systems, models
- Funding requirements exceed industrial capacity
- Commercialization
  - Regulatory support
  - Standardization

Collaborative Research