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ExxonMobil’s Approach to Human Factors

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ExxonMobil’s Approach to Human Factors

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Presentation Outline

• Definition
• Objectives of Human Factors Efforts
• Background - Why Human Factors?
• Human Factors Spectrum
• Corporate Human Factors Strategy
• Human Factors Focus Areas
• New Human Factors Technology
Human Factors are:
the integration and application of scientific knowledge about
- people
- facilities
- management systems
to improve their interaction in the workplace.

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Objectives of Human Factors Efforts

• Our goal is to reduce human errors, resulting in . . .

  ➢ safer operations (fewer incidents),
  ➢ fewer production upsets,
  ➢ higher efficiencies, and
  ➢ enhanced quality.
Incident Performance Improvement History

- Facilities
- OIMS (SHE Management System)
- Human Factors

Incident Rate vs. Time
Why Are We Working on HUMAN FACTORS?

Incident Causal Factors

- Presumed Human Error: 55%
- Equipment: 10%
- Design: 10%
- Weather: 9%
- Other: 16%

These are the incidents addressed by “human factors”

Implemented SHE Management Systems (OIMS)
- Management Leadership
- Risk Assessments
- Procedures
- Incident Investigations
- Management of Change
- Audits

Pursued Traditional Approaches
- Training
- Motivation Campaigns
- Discipline for Violators

Implemented Hardware Solutions
- Protective Systems
- Added Safety Factors
- Reduced Operator Interventions

BUT PEOPLE STILL MAKE ERRORS
WE MUST ADDRESS "WHY?"

WHY ARE WE WORKING ON HUMAN FACTORS?

These are the incidents addressed by “human factors”
The Human Factors “Spectrum”

Workplace Design
- Workplace Design
  - Facility layout
  - Workstation configuration
  - Accessibility

Equipment Design
- Equipment Design
  - Displays
  - Controls (valves, handwheels, switches, keyboards)
  - Hand tools
  - Control panels

Work Environment
- Work Environment
  - Noise
  - Vibration
  - Lighting
  - Temperature
  - Chemical exposure

Physical Activities
- Physical Activities
  - Force
  - Repetition
  - Posture

Job Design
- Job Design
  - Work schedules
  - Workload
  - Behavior-based safety
  - Job requirements vs. peoples' capabilities
  - Task design

Information Transfer
- Information Transfer
  - Labels/aligns
  - Instructions
  - Procedures
  - Communications
  - Training
  - Decision making

Personal Factors
- Personal Factors
  - Stress
  - Agriculture
  - Fitness
  - Fatigue
  - Boredom
  - Motivation
  - Body size/strength
ExxonMobil’s Human Factors Strategy

• HF efforts are driven by specific needs/opportunities for improvement

• Improvements are sustained by building HF into existing Management Systems, Engineering Standards, and Operating Practices

• Effective HF resources and tools are provided to aid implementation

• Roles and responsibilities for HF are clearly defined; management leadership key

• Results are evaluated and shared to enhance benefits and effectiveness
Human Factors Focus Areas

• Design of New Facilities
• Risk Assessment
• Incident Investigation
• Training
• Drilling
• Application in Existing Operations
The Cost of Using Human Factors in Design
New HF Technology Applications

• **ExxonMobil research organizations identify new HF technology/tools through:**
  – leveraging off other industries (e.g., aviation, nuclear, aerospace)
  – obtaining input from operating/project organizations

**3D CAD Projects**

• Incorporate HF considerations (access, spacing, valve location) into 3D CAD models

• Create guidance document for designers

**Automated Control Systems**

• Develop standards for control system interfaces (screen design, alarms, displays, etc.)