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 - Definition

Human Factors are:
the integration and application of scientific knowledge about
- people
- facilities
- management systems
to improve their interaction in the workplace.
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

Time
Why Are We Working on HUMAN FACTORS?

Incident Causal Factors

These are the incidents addressed by “human factors”

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

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

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

Other 16%
Weather 9%
Equipment 10%
Design 10%

Presumed Human Error 55%

BUT PEOPLE STILL MAKE ERRORS
WE MUST ADDRESS "WHY?"
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
  - Automobile
  - 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
Relative Costs

- Early Design
- Plot Plans & GA Drawing
- Construction
- Commissioning
- Normal Operations

The Cost of Using Human Factors in Design

Time
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.)