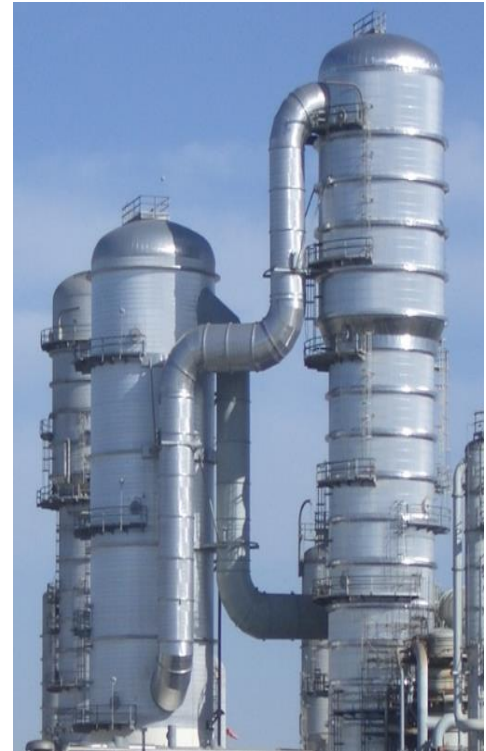


COMPETENCE OF PHA TEAMS

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OVERVIEW

- Meaning
- Importance
- Regulatory requirements
- Competence management program
- Selection of participants
- Assessment of competence
- Performance metrics
- Certification

MEANING OF COMPETENCE

- The ability of people to perform tasks according to expectations
 - Individually and as a group

Ref. Competence Management, Chapter 29, Human Factors Methods for Improving Performance in the Process Industries, AIChE / CCPS, New York, 2007.

ELEMENTS OF INDIVIDUAL COMPETENCE

Fitness for duty

Understanding

Experience

Training

Qualifications

Skills

Behavior

Knowledge

Attitudes

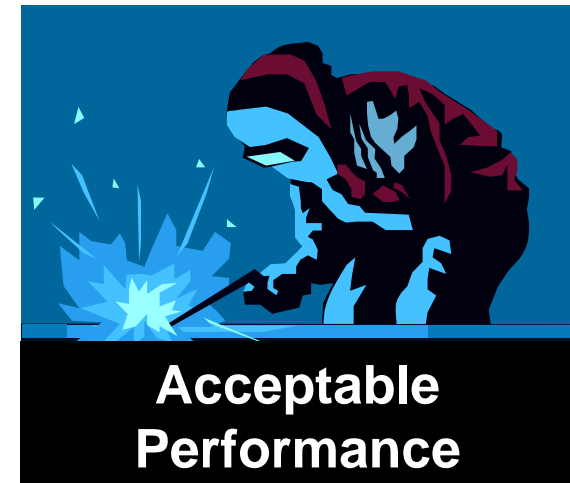


Physical and mental capabilities

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GROUP COMPETENCE

- PHA team must function competently as a group
 - Team chemistry matters
 - Function of the personal attributes of team members
 - » Personalities, backgrounds, behaviors and attitudes
- Incompatibilities can result in dysfunctional teams

IMPORTANCE OF COMPETENCE FOR PHA PARTICIPANTS

- PHA is the cornerstone of process safety
- Poor quality means higher risk than is tolerable
- Quality depends on the individual and group competence of participants

REGULATORY REQUIREMENTS

- OSHA PSM PHA requirements
 - Expertise in engineering and process operations
 - At least one employee who has experience and knowledge specific to the process being evaluated
 - One team member knowledgeable in the specific PHA method being used
- These are minimal requirements
- More detailed requirements are desirable

COMPETENCE MANAGEMENT PROGRAM

- Responsibilities
- Requirements
- Team composition
- Selection criteria for teams and team members
- Development of competencies
- Assessment of competence
- Documentation of competence
- Maintaining competence
- Reassessing competence
- Monitoring competence
- Defining and using performance metrics
- Certification of practitioners
- Continuous improvement

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SELECTION OF PHA PARTICIPANTS

- Utilize selection criteria for:
 - Teams
 - Individual team members
- Different types of team members require different types of competencies



SELECTION OF PHA PARTICIPANTS (CONTD.)

- For each type of participant, base selection on appropriate:
 - Technical qualifications
 - Personal characteristics
- Divide into critical and recommended
 - Ideal participants are unlikely to be found in the real world
- Various positive and negative attributes influence the effectiveness of participants

EXAMPLES OF CRITICAL TECHNICAL ATTRIBUTES - LEADER

- Technical education
- Formal training in PHA and leadership / facilitation skills
- Knowledge of and expertise in the PHA method to be used
- Knowledge of regulatory, industry and company requirements for PHA
- Project management skills
- Motivational / people skills
- Communications skills

EXAMPLES OF CRITICAL PERSONAL ATTRIBUTES - LEADER

- Impartial in the evaluation
- Organized
- Seeks consensus
- High stamina
- Able to focus on multiple items simultaneously
- Respected by the team
- Friendly and cooperative
- Strong personality to control the team and drive the study but not overbearing

PRACTICAL CONSIDERATIONS IN SELECTING PHA PARTICIPANTS

- Often the pool of team members is limited
 - Prevents the selection of an ideal team
 - Compromises likely will be needed
- Availability of people also must be taken into account



PRACTICAL CONSIDERATIONS IN SELECTING PHA PARTICIPANTS (CONTD.)

- May be only one choice of person for a particular role on the team, e.g. process engineer
 - Team leader needs to be ready to deal with any issues that may arise
 - » To the extent that the person does not meet selection criteria
 - Usually in their personal attributes

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ASSESSMENT OF COMPETENCE (CONTD.)

- Technical competencies and some personal competencies can be assessed by:
 - Verbal or written tests
 - Demonstrations
 - Observation of task performance
- Other personal competencies can be more difficult to assess
 - Such as the ability to read people

ASSESSMENT OF COMPETENCE (CONTD.)

- Aptitude tests and psychometric personality tests are used in some fields
 - Desirable for prospective *team leaders*
- May discourage participation in PHA studies by prospective technical *team members*
- Reliance may need to be placed on prior knowledge of their personal competencies

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PHA PERFORMANCE METRICS

- Competence of PHA participants helps to ensure quality PHA studies
 - Identify hazard scenarios as completely as possible
- No way of knowing if all credible scenarios have been identified in a study



PHA PERFORMANCE METRICS (CONTD.)

- Unidentified incident rate is not a good measure of the quality of a PHA study
 - Catastrophic incidents occur infrequently
 - » Not often enough to provide sufficient data to validate effective performance
 - Details of real-world incidents often are far more complex than can be identified by PHA
 - Highly unlikely that any PHA will identify all possible scenarios owing to the difficulty of doing so

POSSIBLE PHA PERFORMANCE METRICS

- Average amount of time taken to identify a hazard scenario
- Ratio of the number of hazard scenarios identified to the size and complexity of the process
- Number and type of departures from PHA guidelines governing the study
- Number and type of findings from periodic audits and audits of team performance

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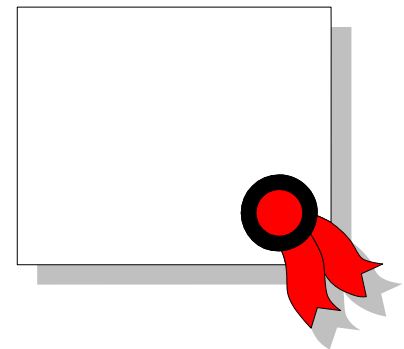
ASSUMPTIONS OF COMPETENCE

- Often inappropriate assumptions of competence are made
- For example, team leaders are considered qualified if they have:
 - Read a book on PHA
 - Been a member of a study
 - Been a scribe for a study
 - Attended a short course



CERTIFICATION OF PRACTITIONERS

- Team leaders, should be certified or accredited by external organizations
 - Owing to the importance of the role they play during a PHA study
- Formal certification of competence against a set of defined criteria is needed



CERTIFICATION CRITERIA

- Academic qualifications
- Experience
- Facilitation skills
- Work products
- Training
- References
- Examination



CONCLUSIONS

- Competence of PHA participants should be managed formally
- Selection criteria are key to a competence management program
 - Cover both technical and personal attributes
- Performance metrics are needed to correlate PHA performance with the assessment of competence

