



ASM® Consortium User Member Prospectus

What is the ASM Consortium? The Abnormal Situation Management (ASM) Consortium is a group of leading companies and universities involved with process industries that jointly invest in research and development to create knowledge, tools, and products designed to prevent, detect, and mitigate abnormal situations that affect process safety in the control operations environment. The Consortium was conceived in the early 1990s in an effort to define improvements to current DCS alarm system technologies. Today, the ASM Consortium is represented by 12 companies and universities and has jointly invested over \$50M in research towards abnormal situation. The Consortium creates knowledge and products to ensure **safe, reliable, and efficient** process operations.

Safety

Protect People, Assets
and Process



Billions lost per year
in Petrochem Industry

Reliability

Improve Availability
Reduce Downtime



Millions lost per year
due to unplanned
production losses

Efficiency

Improve Productivity
Reduce Cost



Fewer people
can make better
decisions, faster

Globally, billions of dollars are spent each year by companies in the process industries due to plant incidents that could have been prevented. These incidents can end in explosions, fires, toxics spills and emissions, and personal injury or death. As a result, companies are experiencing unplanned costs for lost production, equipment repair, safety and environmental penalties, insurance and litigation costs as well as damage to their brands. The industry leaders in the ASM Consortium believe that working together with other industry leaders and principal universities will lead to the identification of best practices that can be shared for the benefit of the entire process industry.

What are Abnormal Situations? Abnormal situations are undesired plant disturbances or incidents that exceed the design limits of the automation system requiring human intervention to supplement the actions of the control system. An abnormal situation could be a simple upset condition quickly rectified by operator action or it could escalate to a critical incident, where a safety system is engaged and evacuation



and rescue are required. The work of the ASM Consortium has shown that incidents are caused by a multitude of factors and solutions to address incidents need to consider a more comprehensive and holistic approach to the human operator's role, the technology the system design, as well as the environment. The ASM Consortium addresses all these areas.

Why is the ASM Consortium work important? The ASM Consortium estimates that abnormal situations cause 3 – 8% of lost production capacity. Recovering this capacity can be a significant productivity benefit. Additionally, since the BP Texas City incident in 2005, the attention and emphasis on process safety is increasing exponentially. Recently, OSHA published the following statistics for Hazardous Chemical Incidents at refineries in the United States since 1992:

- 36 - Fatality/catastrophic incidents related to hazardous chemicals releases
- 52 - Employee deaths related to fatality/catastrophic incidents
- 250 - Employee injuries related to fatality/catastrophic incidents
- 98 - Injuries that resulted in hospitalization from fatality/catastrophic incidents

Safety incidents cause companies billions of dollars each year. In our attempt to squeeze the highest possible productivity from aging plant resources, our facilities are running closer and closer to design limits, making costly disruptions even more likely.

Mitigating abnormal situations in process plants can have a significant impact on improving safety and reducing costs.

Who are the current ASM Consortium members? In addition to Honeywell, User members include BP, ConocoPhillips, ExxonMobil, SASOL, and Shell. Associate and University members include HCS (Human Centered Solutions), KBC Advanced Technologies plc, Nanyang Technological University (Singapore), the Mary Kay O'Connor Process Safety Center at Texas A&M and UCLA.

What do we mean by “jointly” invested? Honeywell and members invest in the work of the Consortium. Each member company pays a fee to join and each year they pay membership dues and contribute “in-kind” hours to participate in projects and activities approved by the Consortium. Honeywell invests resources to lead and manage the efforts as well as funding for research and development. With this structure, the Consortium influences over two million dollars each year in spending towards research, development and communication initiatives.

How does the ASM Consortium benefit Member Companies? Because the Consortium has customer and university participation and over a decade of experience, it is recognized in the industry as one of the preeminent organizations involved in improving process operations and reducing plant incidents. The knowledge gained from working on projects in the Consortium with leading companies in the industry is translated into recognized best practices and guidelines that all member companies benefit from.

Member Companies benefit from Best Practice Guides, Research Reports, Solution Webinars, Early Adoption Programs, Best Practice sharing from peer companies and

they are invited to influence the direction of Honeywell products and services to incorporate ASM best practices. Member companies report that the one of the most valuable aspects of membership is the opportunity the Consortium provides to openly discuss what other companies are doing to achieve improvements in their organizations. The sharing of member company experiences on selected topic areas provides for a unique opportunity to learn from companies in similar industries.

How does the ASM Consortium address abnormal situations? The Consortium looks at the universe of ASM through seven focus areas that fundamentally help customers improve safety, reliability, and efficiency of their process operations. In each area you will find details, examples, research and analysis, product recommendations, and in some cases guidelines to help you implement solutions.

1. Understanding ASM: This area focuses on measuring, reporting, analyzing, and communicating the causes and effects associated with abnormal situations.
2. Management Structure & Policy: This area focuses on management practices that influence the organizational culture, work processes, staff roles and responsibilities, and valued behaviors as they relate to abnormal situations.
3. Training & Skill Development: This area focuses on the development and maintenance of a competent work force through training and the creation of a continuous learning environment so that personnel can effectively respond and cope with abnormal situations.
4. Communications: This area focuses on daily communication and situational dialog among plant personnel and explores opportunities to use information technology that improves site-wide coordination in all situations.
5. Procedural Operations: This area focuses on all aspects of procedure use such as accessibility, accuracy, clarity, and policy compliance so that personnel can accomplish important tasks at an industrial site, particularly start-up and shut-down.
6. Work Environment: This category focuses on work place design factors that impact performance of personnel during abnormal situations.
7. Process Monitoring Control & Support: This area focuses on effective design, deployment, and maintenance of hardware and software platforms that support process monitoring, control and support for effective operations.

The consistent element running through the seven ASM focus areas is the connection between the system and the human. Abnormal Situations do not always occur because of human error; however, the ASM Consortium has established that to reduce and control abnormal situations, you must account for the strengths and limitations of humans.

What are the benefits of ASM Consortium Membership?

Optimizing production, reducing variability and costs, improving safety and respecting the environment are most likely goals of your company. The ASM Consortium can provide you with research, reports, tools, and best practices that can help your company achieve these goals.

Benefits include:

- An on-site assessment provided by experienced ASM Members includes a best practices report identifying the areas of ASM the new member company should focus on. This can be extremely valuable in avoiding costs on areas that do not need major improvement, and in focusing on areas where there will be the most significant return.
- The opportunity to participate in Consortium-funded R&D efforts, propose collaborative projects, such as field tests, and receive funding from the Consortium Joint Fund to fully or partially fund the project.
- Full access to the members-only Consortium database offering over fifteen years of proprietary Consortium research. Included in the database are members-only best practices guideline documents and results of all research projects. Any member employee may register for free access to this database.
- Participation for as many employees as desired in all Consortium-sponsored meetings, such as information-sharing workshops.
- The opportunity to recommend how Honeywell developments should be funded.
- First access to new Honeywell products or enhancements that are tailored to User Member needs, and early knowledge of how to take advantage of these enhancements.
- The opportunity to communicate with Honeywell executives on issues and opportunities in the area of ASM.
- Networking with fellow members to exchange information, compare results, etc.
- Unlimited use of the pre-product solution concepts.
- Opportunity to freely apply consortium learning's within their organizations using any available tools.

What are the requirements for User membership in the Consortium? New companies are invited to join the ASM Consortium based on their willingness to participate in Consortium activities and share "best practices" relevant to ASM Consortium objectives with all members of the Consortium. The annual fee for Consortium membership is \$50,000 per year and each User Member is also expected to contribute at least 1/4 FTE (Full-Time Equivalent) labor (450 hours) each year as an In-kind Contribution. In kind contribution may be met through user member participation on projects or activities meeting the acceptance criteria of the Research, Development, and Communications Programs, as appropriate.

New User Members pay an initiation fee of \$300,000. Included in the initiation fee is the cost of hosting an ASM Best Practices Site Assessment (approximately \$125K) and the results are a direct benefit to the member company. The balance of the initiation fee may be provided to the ASM in non-cash form subject to approval by the Executive Steering Committee. Examples of non-cash form initiation include sharing of member best practices as well as increasing in-kind contributions.

User Member Participation Requirements.

- Provide a company principal representative, and an alternate, to be an active, voting member of the Consortium Executive Steering Committee.
- Provide at least one representative from site Operations to be the representative for Operations-oriented activities.
- Attend the three face-to-face Consortium meetings each year, either by the company principal representative or an alternate.
- Host one full Consortium meeting every three years including: arranging logistics, meeting room, lunches, break refreshments, and one dinner.
- Communicate the results of the ASM Consortium activities broadly within the member company to ensure that the benefits of ASM membership are being disseminated and deployed.
- Report the results of ASM Consortium-related activities to other Members and Affiliates according to the requirements of the Executive Steering Committee.

The Consortium is actively interested in recruiting new companies to participate in our efforts to improve the safety, reliability, and efficiency of process plant operations. Thank you for your interest in joining the ASM Consortium. Should you have additional questions, please contact me at your convenience.

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