



Startup Hazards

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A number of chemical facilities have had disastrous events occur during startup activities. In many cases, these events point to the need for a higher level of attention and care than that needed for routine processing. WHY? Startup hazards are increased by inexact operating instructions, lack of experience in startup operations, and a plant in a non-standard condition – for example,

feed tanks empty, manual valves in the wrong position, new or modified equipment. Time pressures to get the plant back in operation may be high, and operators may have worked long hours during the shutdown, making them less alert. Many plants require manual operation during startup. Continuous plants may startup so infrequently that plant personnel have little experience with required steps.

Did You Know?

- Of 38 major incidents investigated by the U.S. Chemical Safety and Hazard Investigation Board (CSB) since 1998, three occurred during startup of continuous process equipment.
- These three incidents resulted in 22 fatalities and more than 170 injuries.
- Other serious incidents occurred during startup of batch processes or during maintenance operations that followed a power outage.
- Startups may be rare, so refresher training may be needed.

What You Can Do

- Have complete and accurate written startup procedures and checklists, and **use them**.
- Use Management of Change reviews before modifying any startup procedures.
- Ask questions and get help with startup operations which are not familiar to you.
- Check with the responsible people that shutdown activities have been completed and equipment approved for use.
- Verify equipment functionality and setup before startup, including pre-startup safety review after major maintenance or modifications.
- Make sure all valves are in the proper position.
- Maintain excellent communication between outside operations and the control room!



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Plan for safety for start to finish!