Mental Fatigue Impairs Decision Making Strategy

Most major oil and chemical companies have seen the problems associated with operators fighting to save a unit from having to shutdown. Prolonged periods of high alarm actuation rates, constantly changing/shifting conditions, and rapid decisions have resulted in the shutdowns that operators were attempting to prevent. Often the shutdowns come with considerable costs to equipment and the environment. Many companies have taken the approach that rather than fighting the unit, the plants should be “parked,” taken to a safe stable condition until additional personnel are available to reduce the workload. Recent research indicates that this might be a prudent approach.

We all “know” that becoming mentally tired will reduce our ability to perform mental tasks; but how will the reduced ability manifest itself? A study by Dimitri van der Linden, Michael Frese and Sabine Sonnentag gives some insight into what happens when we become mentally fatigued. Dealing with non-routine situations often requires exploration activities to determine the best method for problem resolution. In this study, exploration strategies were investigated for both experienced and inexperienced subjects (“The Impact of Mental Fatigue on Exploration in a Complex Computer Task: Rigidity and Loss of Systematic Strategies”, Human Factors, V45, No. 3, 2003, p 483-494).

With fatigue, exploration strategies became less systematic, more trial-and-error, and more prone to mistakes regardless of experience level. However, the less experienced subjects also showed signs of increased rigidity, continuing to repeat “dead-end” paths or strategies. Knowing that operators dealing with an upset are certainly facing fatigue and therefore likely to become more rigid in their problem solving strategies, parking the unit is probably the safest option.

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