



## FOUR-PART FRAMEWORK FOR NEEDED MATH PROJECT SCENARIOS —NSF AWARD # 2100062

### *PURPOSE, USE, AND DEVELOPMENT OF SCENARIOS* Dr. Gerhard Salinger, Former Lead NSF Program Officer, Advanced Technological Education Program

The scenarios represent actual work that industrialists maintain that technicians do. The scenarios are to be derived from discussions between faculty in technical programs in two-year colleges and their industry advisory boards about the mathematical competencies and skills needed by technicians in the manufacturing workplace. The mathematical content will be pointed out so that the important mathematical competencies needed by technicians can be discussed in advisory board meetings and influence modification of curricula. The scenarios may also be used in classes to motivate the study of certain mathematical concepts and also answer the student question “When am I ever going to use this stuff?” The project wants to test these ideas in ATE project and Center advisory board meetings and their use in technical education and mathematics classes.”

#### 1. **Problem Statement** (these problems would come from industry).

*A succinct statement describing the problem presented to the technician.*

#### 2. **Scenario Description and Specific Example**

*A description of the context within which the technician is working, a short explanation of the processes involved, and what technicians in manufacturing might find difficult. This can be considered to be a use case. The description clarifies what the technician must do to address the presented problem given specific requirements (e.g., temperature levels, tolerances, volumes).*

#### 3. **Issues to be addressed in the lesson** (specific issues that might be confronted by technicians in the workplace could be raised).

*These might include additional information necessary or useful to enhance understanding of the task and thus its performance after being presented to the technician. Issues might flag common misconceptions, attractive but erroneous approaches that might lead to mistakes being made, and issues to which particular attention should be paid.*

#### 4. **Mathematics**

*Mathematics competencies technicians possess and use to solve the presented problem.*

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**Supporting materials that might come from educators or industrialists could include:**

#### **Questions to Address**

*These questions would stimulate discussion, clarify ways in which the problem might be approached, explain conclusions, and interpret data.*

#### **Teacher Resources and Notes**

*These could include pedagogical hints, related videos, annotations, and sample problem solutions.*