

Defining Statement

Issue Topic: *Short title for topic:*

Cost

Number
identifier
17

Project

Name of the project: **Space Station**

Originator

Original producer (sponsor) of this document: **J. Montague**

Contributors

Contributors of additions and/or changes

5 September, 1985 **J. Nielsen**

6 September, 1985 **B. Dickinson**

11 October, 1985 **C. Owen**

Source/s

If references are used, give complete information. Use **The Chicago Manual of Style** for format.

Examples:

*Financial Models for Large Projects. In **New Economic Planning**. New York: Business/Government Press, 1983.*

*Johns, R. **Space Station: How Much?** **NASA Review** 8, No. 3 (May 1985): 7-9.*

Meeting with Jay Cory 8/30/1985.

If there are no references, use: Team deliberations.

Question at Issue *Question raising an issue that requires a position.*

How should the cost of the Space Station be treated in terms of its impact on design strategy?

Position

*Position to be taken on the issue. Use **must** for constraints, **should** for objectives, **ought to** for directives. Designation of **Constraint, Objective** or **Directive** establishes force to be accorded the Position.*

- Constraint** Cost must be treated as total cost (vs. initial cost) to accommodate planning for unforeseen problems and opportunities.
- Objective**
- Directive**

Alternative Positions

*Other plausible positions. Should be arguable and may have resulted from discussion or debate within the team. Should also be clearly inferior to the selected position on the basis of the background and arguments presented. State the alternative positions in a form equivalent to the selected position (using **must, should** or **ought to**).*

- Constraint** Costs must be what is minimally required to put a station in orbit. Follow-on projects should await successful demonstration.
- Objective**
- Directive**
- Constraint** Project costs should be allocated to phases with each phase's targets designed to attract and support further spending.
- Objective**
- Directive**

Background and Arguments

Background material and arguments that explain and defend the position taken on the issue. For a Defining Statement to be useful, something must be at issue, and there must be more than one plausible position that could be taken. The material in this section should show clearly why the chosen position is superior to the alternative positions.

The sheer size of any projected space station as well as its necessarily large cost means that any budget will be severely scrutinized by Congress (Cory 8/30/1985). Competing projects and the general sensitivity of Congress to public concerns about governmental spending demand that the budget be not only thoroughly defensible but also justifiable in terms of a well-reasoned design and construction philosophy (Johns 1985, 27).

Large projects usually are expected to have long enough lifetimes to be productive in return on investment. In the case of the Space Station, its lifetime will last well into the 21st century. To remain productive, however, a space station—unlike many other large projects—will have to adapt frequently and, perhaps, massively to new technologies. This means that, as a fraction of total cost, initial costs may be relatively low—depending on how well the systems are designed to be adaptive. A station designed without regard for adaptation may be a bargain initially, but will cost considerably more over its lifetime if (as is highly likely) major changes have to be made, and they cannot be made easily (New Economic Planning 1983, 133-134).

Projects expected to evolve over time—especially those (like Space Station) in which the directions of evolution are uncertain—are best served with a design and construction philosophy that maximizes the potential for adaptation. This means that more time, effort and money must be spent considering how elements of the system can be used in multiple ways and how configurations can be changed readily to accommodate new components, processes and missions. Extra funding spent early under this design philosophy will reduce funding that will inevitably be spent later to make difficult changes. Overall, total costs, with the unplanned costs of future changes, will be lower under a policy that anticipates change and plans for it in the beginning.