

# **The International Space Station**

**A new way of doing business**

by

W.M. (Mac) Evans

Project Management Shared Experience Program  
(PMSEP 6)

September 10, 2002

# **The International Space Station**

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### **Background**

- **January 1984 (State of the Union Address)**
  - **NASA develop a permanently manned space station within the decade**
  - **Invite other countries to participate**
  - **Objective to "strengthen peace, build prosperity, and expand freedom for all who share our goals"**
- **A Cold War demonstration of US leadership and alliance solidarity**
  - **US to build a fully functional Space Station with international partners providing enhancements**

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### **Current Status**

- **Evolved from Cold War instrument into an icon of post-Cold War cooperation with Russia**
- **Largest international technology program ever undertaken**
- **First Element Launch in December 1998 was a Russian element launched from Baikanour**
- **Permanent occupancy started in December 2000 with combined American and Russian crew**
- **All partners now providing "critical elements" instead of "enhancements"**

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### **Management Structure**

- **Inter-governmental Agreement (IGA)**
  - **Government level (treaty) multilateral agreement**
  - **Signed by the governments of all partners**
  - **Defines political and high-level programmatic commitments**
- **Memoranda of Understanding (MOU's)**
  - **Signed between NASA and each of the cooperating Space Agencies (ESA, Canada, Japan and more recently, Russia)**
  - **Define in detail the programmatic commitments and obligations and management relationships between NASA and each of the other implementing Space Agencies**
- **Implementing Arrangements**
  - **Definition of Multilateral and bilateral arrangements for ensuring the effective implementation of the program**

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## **Unique Management Challenges**

- **Size, complexity, cost, duration of program**
- **Managing a politically motivated program through major political changes**
- **Change from US-led program to a "genuine partnership"**
- **Addition of new partners**
- **Changing priorities of partners**

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### **Size, complexity, cost, duration of program**

- **14 nations involved**
  - Different cultures, languages, laws
  - Different program objectives
  - Different priorities that change over time
- **Most expensive line item for all participating Space Agencies**
  - Subject to constant attack from other programs
  - Cost overruns affect significantly other activities
- **Program is almost 20 years old**
  - Nobody around with corporate memory
  - Major technology changes

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### **Managing through Political Change**

- **End of the Cold War**
  - Integrate Russia into program
  - Need to change IGA and MOU's
- **Changing economic scene**
  - Reduced contributions by all partners
  - Increased use of bartering
- **Change of governments in all participating nations**
  - New national priorities
  - Different priorities for space programs

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### **Developing a Genuine Partnership**

- **Original concept was for US-led program**
  - **US provide fully functional Space Station**
  - **International partners provide only "enhancements"**
  - **Eventually all partners provide critical elements**
- **Partners retain ownership of contributions**
  - **Necessitated changes from relationships developed on Spacelab and Canadarm programs for Shuttle Program**
- **Need for more integrated program management**
  - **US became "first among equals"**
  - **Consensus management style**
  - **US chairs committees**
  - **Appeal mechanisms necessary**

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### **Adding new partners**

- **Wasn't anticipated in original agreements**
- **Necessitated changes to IGA**
  - **Re-opened national debates about value of program**
  - **Required government re-commitment to program**
- **Changed fundamental nature of partnership**

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### **Changing Priorities of Partners**

- **Original objectives of partners**
  - **US: leadership of the "free world"**
  - **Canada: economic benefits**
  - **Europe: autonomous human presence in space**
  - **Japan: international cooperation**
- **Many of these objectives have now changed**
  - **Change in elements to be provided**
  - **Change in relationships between Agencies**
- **Utilization of Space Station**
  - **More commercial in nature**
  - **Further downstream than anticipated**
  - **Benefits being questioned**

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### **Lessons Learned from Space Station Arrangements**

- **The art of compromise**
  - Need to accommodate different and changing national interests
- **The use of "constructive ambiguity"**
  - Needed to avoid potential show stoppers
  - E.g. peaceful purposes issue
- **Funding**
  - Multi-year funding for long-duration programs
- **Need for Consensus Management**
  - Affects efficiency of management process
  - Absolutely essential
- **Allow for new partners**
- **Flexible arrangements that can accommodate change**

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### **Implications for Project Managers**

- **Managing the classical parameters (cost, schedule, performance) is no longer sufficient**
- **Must manage through political changes that will have fundamental impact on program**
- **Diplomatic skills are essential to the "first among equals" concept**
- **International cooperation takes considerable extra time and effort**
- **Ambiguity (in program objectives, management processes, inter-agency relationships) is the norm**
- **Flexibility is essential.**