Technical Specifications and Documentation Control
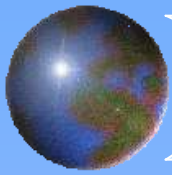
Victor Billig
International Space University
Strasbourg
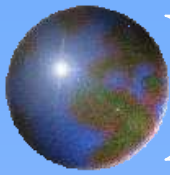### *bernd@madauss.com*
2010

Baseline Documentation

- **Project Contract** *(legal terms & definitions)*

- **System Specifications** *(technical definition)*
  - **System Requirements Specification**
  - **Subsystem Requirements Specifications**
  - **Interface Specification**
  - **Quality Assurance Specification**
  - **AIT Specification**

- **Statement of Work (SOW)**
  - **Description of Tasks to be performed**
  - **Summary of Deliverables**
    - **Deliverable Items List (DIL)** *(hardware & software)*
    - **Document Requirements List (DRL)**
   - **Document Requirements Description**

Baseline Documentation

Sample Table of Content of Space System Specifications:

- **Introduction**
- **Space Segment**
  - **Spacecraft Design (Satellite or Other Space Object)**
  - **Spacecraft AIT**
  - **Associated Ground Support Equipment (MGSE& EGSE)**
  - **Transportation to Launch Site**
- **Ground Segment**
  - **Ground Control Centre (GCC)**
  - **Tracking System**
  - **Services**
- **Software**
  - **Spacecraft Software**
  - **GCC Software**
  - **Software Acceptance (End-to-End-Tests)**
  - **Software Operating Procedures**
- **Launch and Launch Support**
  - **Launch Vehicle Compatibility**
  - **Launch Site Support**
  - **Post-Launch Support**
- **Project Reviews**
 - **PDR, CDR, FRR, MRR, FAR**

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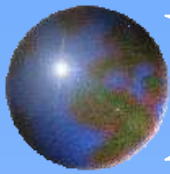
Technical Documentation and Control

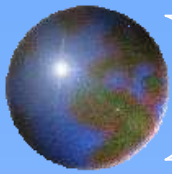## Baseline Documentation

Sample Table of Content of a Statement of Work:

- **Introduction (Purpose)**
- **Scope**
- **General Background**
    - **Technical Requirements,**
    - **Constraints**
    - **Applicable Documents**
    - **Reference Documents**
- **Task description**
    - **Engineering Tasks**
        - **Design (Hardware and Software)**
        - **Development**
        - **Prototyping**
        - **Tests**
    - **Prototype Manufacturing**
    - **Prototype Testing**
    - **Reporting and Documentation**
    - **Project Management**
- **Project Deliverable Items List (DIL)**
    - **Hardware**
    - **Software**
    - **Contract Document Requirements List (CDRL)**
    - **Data Requirements Description (DRD)**
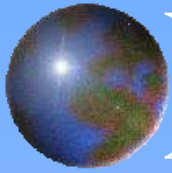
Baseline Documentation

- **Project Plans**

  - Work Breakdown Structure (WBS)
  - Project Milestone List
  - Project Time Schedules
  - Project Cost Plans
  - Project Control Plan
    - Schedule Control
    - Cost Control
    - Earned Value Analysis
  - Documentation Control Plan
  - Configuration Control Plan
  - Design & Development Plan
 - Assembly, Integration & Test (AIT) Plan
  - Facility Plan

Baseline Documentation

Sample Table of Content of Project Contracts:

- **Scope of Work (Reference to Specifications, SOW and Plans)**
- **Deliverables and Services and related Prices**
- **Project Options**
- **Payment Schedules**
- **Delivery Dates and Adjustments for late Deliveries**
- **Progress and Status Reports**
- **Inspection and Acceptance**
- **Project Changes and Change Control**
- **Rights in Data and Proprietary Information**
- **Intellectual Property Rights**
- **Subcontractors and Key Personnel**
- **Communications and Project Language**
- **Force Majeure**
- **Arbitration, Applicable Law**
- **Effective Date of Contract**
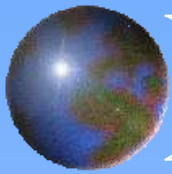- **End of Contract and Termination**
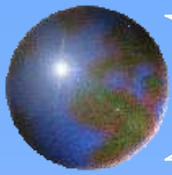
The PM is obligated to control the actual status of all project documentation and the system configuration

At project start the PM shall prepare a documentation requirement list (DRL), respectively a contractual DRL (CDRL)

A sample DRL is provided at following slide

Technical Documentation and Control

Document Requirement List

| PROGRAM/ PROJECT	DATA REQUIREMENTS LIST (DRL)		DRL-Nr.:
DOC-Nr.	Document Title/Brief Description		Due Date
SP-01 Sp-02	System Specification Subsystem Specification		To To + 1 mo.
PL-01 PL-02 PL-03 PL-04 PL-05	Program Plan D& Plan Master Time Schedule Manpower & Cost Plan Monthly Status Report		To To + 3 mo. To To monthly

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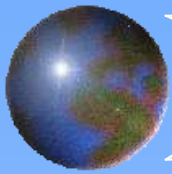
Sample Documentation Code

PPP – DDD – WWW – RRRR – I . a
PPP   = Project Name DDD   = Document Code (SP = Specification, PL = Plan WWW   = WBS Code (if applicable) RRRR   = Unique Running Number (0001 to 9999) I   = Issue (I, II, III, etc.) a   = Change index within an issue (a, b, c, etc.)

Documentation release and distribution to the assigned recipients shall be performed by the PM in accordance with the implemented project organization
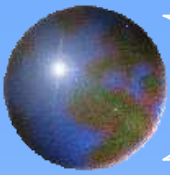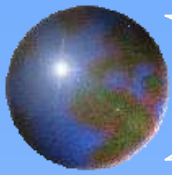
Configuration Control Procedure

Configuration control starts after approval of the system specification at the System Requirement Review (SRR)

A formal configuration control procedure will be implemented at contract award and confirmed at the preliminary design review (PDR)

The aim is to ensure that the products developed within the frame of the program/project are conforming to an agreed system specification

Configuration Control Procedure

Configuration control system covers the following topics:

1. Identification of the Configuration Items (CI's);

2. Identification, maintenance and updating of the configuration baseline;

3. Identification and control of all physical and functional interfaces;

4. Organization of Configuration Control Board (CCB) meetings

5. For change an engineering change proposal (ECP) shall be prepared;

6. Customer changes shall be filed as class "A" changes

7. All other engineering changes are to be filed as class "B" changes;

8. For class A changes a contract change notice (CCN) shall be issued;

9. PM shall provide on a regular basis a design and as built configuration and waiver status list
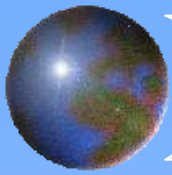
Configuration Control Procedure

The configuration control function is related to identification, control and reporting, of the following:

1. Baseline control including identification and documentation of functional and physical characteristics of systems, subsystems and products;

2. Control of changes to the characteristics of the identified items, with verification of compliance to agreed requirements;

3. Detection of implication of changes applied to one configuration items on others and on systems;

4. Recording of changes, documentation and reporting of changes and implementation status;

5. To make sure that all program/project participants have the same view and use identical data during the life cycle of the program, in a consistent and controlled manner.
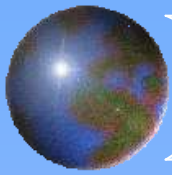
Configuration Control Board

The CCB will approve or disapprove the request for an ECP. Permanent members of the CCB will be the key people of the PM team

Specialists from functional departments and/or partners may be invited to participate to the CCB

All CCB members, whether permanently assigned or specially invited, must be fully authorized to take decisions on behalf of their respective organization, and to accept actions placed upon the organization they represent

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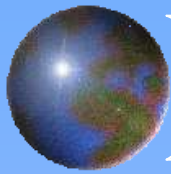
Recommended
Project Management Literature

- Kerzner, Project Management & Study Guide, 8th Edition
- Madauss, Projektmanagement, 6th Edition, 2000, German
- Verzuh, The Fast Forward MBA in Project Management, 1999
- Terry, Principles of Management, 7th Edition
- ESA, Space Project Management, ECSS-M