European Space Operations Centre

The Quality Management System at ESOC from a User Perspective

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Road Map

- Context
- The Need for a Quality Management System
- The Implementation
- The Users Difficulties
- The Current Structure of QMS
- Feedback from Users to QMS
- Looking Forward
- Conclusions

The Context

- European Space Operations Centre (ESOC)
- More than 40 years of success in space operations planning and execution
- Support to all types of satellite mission:
  - Geostationary for telecommunications and meteorogical satellites
  - Low orbits for Earth observation
  - Highly eccentric orbits for astronomy missions
  - Interplanetary exploration.
- Development of a leading ground segment infrastructure:
  - Network of Ground Stations
  - Mission Control Software
  - Flight Dynamic Software
  - Navigation Technologies

The Need for a Quality Management System

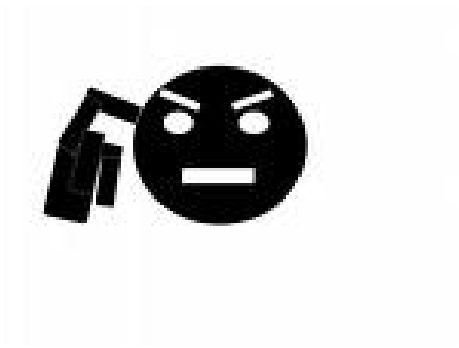
- Up to 1997 Quality was embedded in the day-to-day work at ESOC:
  - Expertise accumulated in skilled staff
  - Local cultures for same activities
- It was felt the need for:
  - Service oriented approach
  - Focus on standardisation and improvement
- Decision for ISO9001-2000 certification:
  - Formalise all processes
  - Ensure, measure and maintain Quality
  - Implement internal and customer feedback

The Implementation

- In 1997 the Directorate nominated:
  - Several teams of experts
  - A Quality Manager as focal point
- The Quality Management System has been developed by:
  - Describing existing processes
  - Identifying roles and responsibilities
  - Defining high level guidelines
- Formal ISO9001-2000 certification achieved in Nov. 1999
  - Initially just ESOC QMS
  - Today OPS QMS, including all sites where directorate activities are carried out

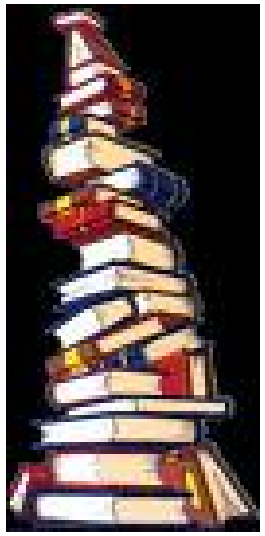
The Users Initial Difficulties

- Initial adaptation to standardised procedures
- Perception of increased bureaucracy and paperwork
- Local practices found different from approved ones
- Different motivation between
  - Areas with detailed work instructions
  - Areas with generic guidelines (due to high competence of staff)
- Conflicts and overlapping of responsibilities
- Long preparation cycle of a single procedure wrt evolving reality



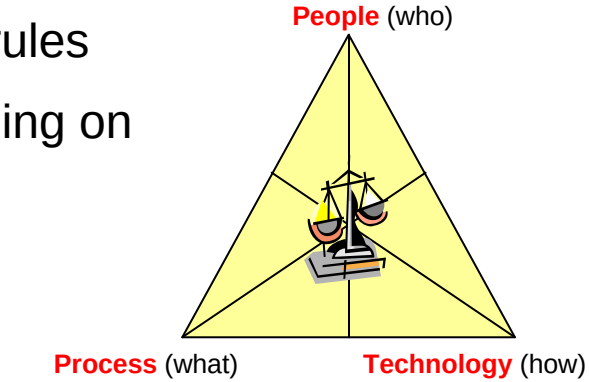
Proliferation or Scarcity?

- Enthusiasm for generating many new procedures can lead to inefficiency:
  - Staff requested to comply to several standards
  - Heavy QMS maintenance and control
- Processes not yet described due to:
  - New functions acquired in the directorate
  - Internal re-arrangement of the organisation
  - Possibility to merge/extend existing procedures
- Continuous search for right balance between
  - Systematic coverage
  - Optimised maintenance



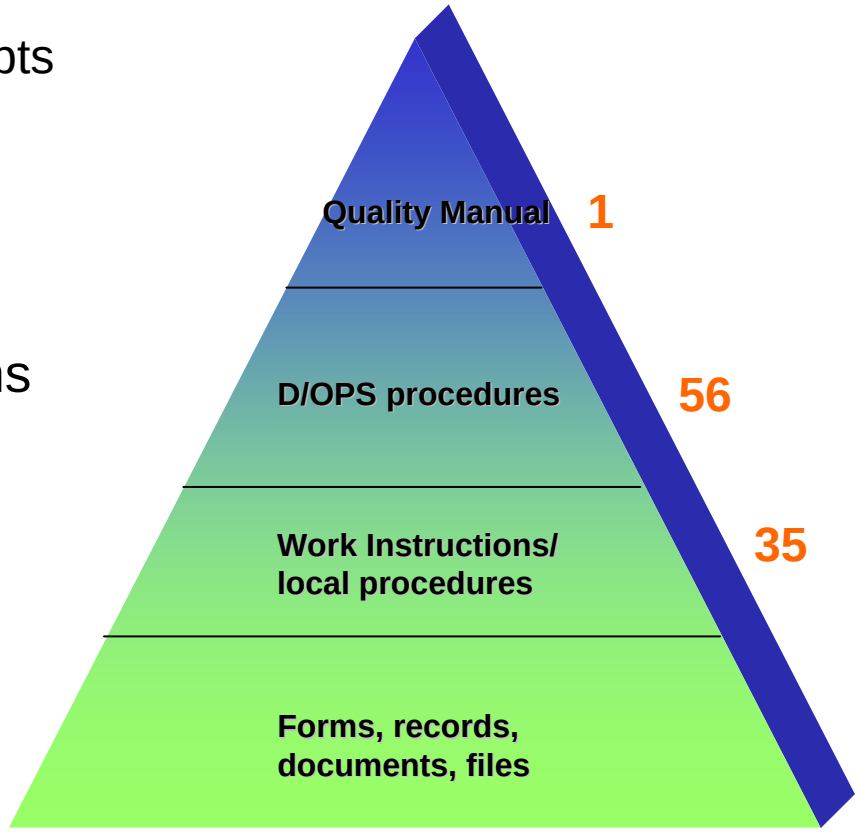
(In)Adequate Tools

- In the QMS the Documentation Management process is controlled with strict rules and regularly audited
- The current Directorate tool is inadequate to support staff for
  - Reference numbering
  - Storage, search and retrieval
  - Review, change control and update
  - Approval
- Consequently:
  - Staff is uneasy to comply with documentation rules
  - The Quality Office is requested to provide training on documentation policy
- A Corporate complete solution is to be found



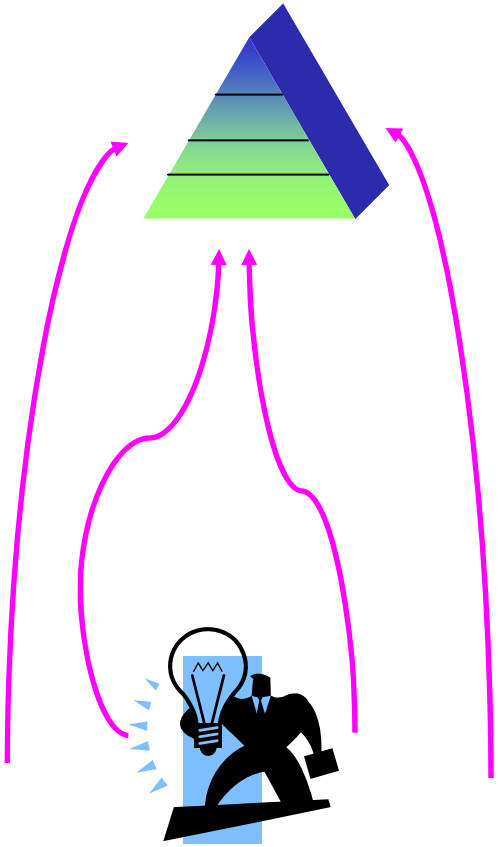
Current Structure of OPS QMS

- Quality Manual:
  - Map against ISO9001-2000 concepts
  - Summary of the entire system
- Few OPS policies
- Procedures, Work Instructions, Document Requirements Definitions
- Domains:
  - ESA Infrastructure and Mission Operations (EIMO)
  - ESA Informatics and facility Management (EIFM)
- Local procedures (ESA sites)



Feedback from Users to QMS

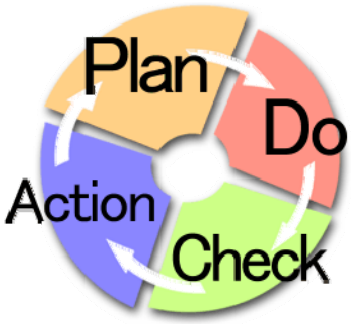
- Working groups to draft procedures
  - Members selected by Management
- Public review of a drafted procedure
  - Observations to appointed reviewers
- Minor corrections via Document Change Requests (DCR) at QMS web site
- Improvement suggestions from internal audits:
  - OPS QMS Improvement Forum
  - Domain specific Improvement Boards
- Lessons Learned on processes/practices



Way Forward

- Streamline the number of procedures against
  - the efficiency of the system
  - the implementation by the staff
- Stimulate continuous feedback from staff
  - During audits
- Monitor the adequacy of tools for staff
- Address costs of non-quality

Conclusions



- QMS provided a silent revolution in a successful but conservative environment
- Today the QMS is fully accepted by staff as the way to achieve and measure Directorate objectives
- The QMS supports some measure of non-quality:
  - Process weaknesses
  - Inefficiency in roles and responsibilities
- The QMS provides evidence of organisation capabilities:
  - Reliable reference for cost drivers
  - Requirements for work excellence
- Staff shall identify and correct any QMS inefficiency to ensure the success of the work and the satisfaction of Customers
- Documentation process improvement must be supported by an adequate tool