

Data Quality Issues

The State Quality Plan has been designed purely for the Quality Assurance (QA) of the origin of WGS 84 data, largely relying on the acquisition by survey crews. The scope of this quality plan does not extend to include the management of all the navigation data processes that may be the responsibility of an AIS department. The State Quality Plan has to be viewed in relation to other plans that may be needed to operate relevant standards and specifications for different segments of the data handling process. Such as for:-

- formatting of the data in a secure manner for storage (database).
- validation and verification.
- transfer to other users.
- handling of shared data originating in other organisations.
- maintenance, updating any changes.
- control over what is published, utilising various media - e.g. electronic library, charting etc.

Each of these plans should contain the specific controls and technical aspects that are designed to support the overall general Quality Management System (QMS) policy.

It is useful to consider the point of view that a user would have when assessing the quality system of a supplier.

Figure 1 shows a possible structural relationship in what may be described as a complete data management quality system composed of a number of quality plans operated by separate but related groups in an organisation. Note that it is the overall data QMS that provides centralised assessment and accountability.

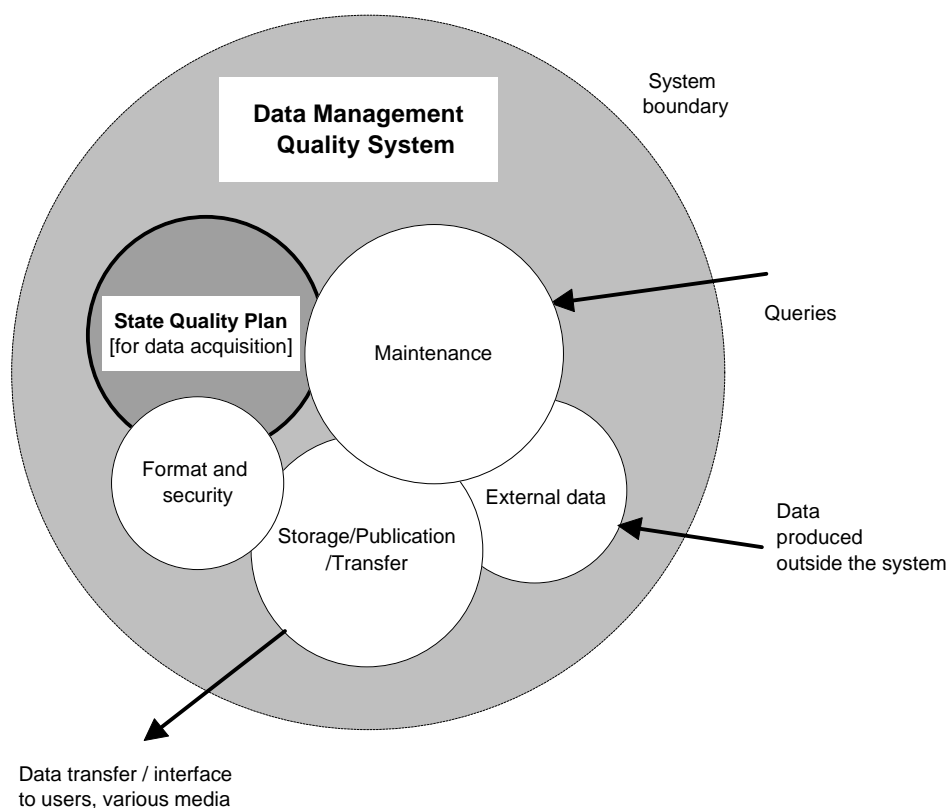


Figure 1

A user has to be confident that all the data is handled securely and consistently. The State Quality Plan provides quality assurance for the purposes of acquiring the WGS 84 data only. Additional procedures will need to be established to manage the onward flow of this data. These procedures need to assure the user that the validity and integrity of the data is maintained. The user will also have to employ QA procedures himself, in order to ensure the consistency through to the point of application.

The relationships shown in figure 1 can be represented in the following diagram (figure 2), an example of how the component quality plans could be related in a quality loop of a QMS for management of data up to the point of delivery to a user.

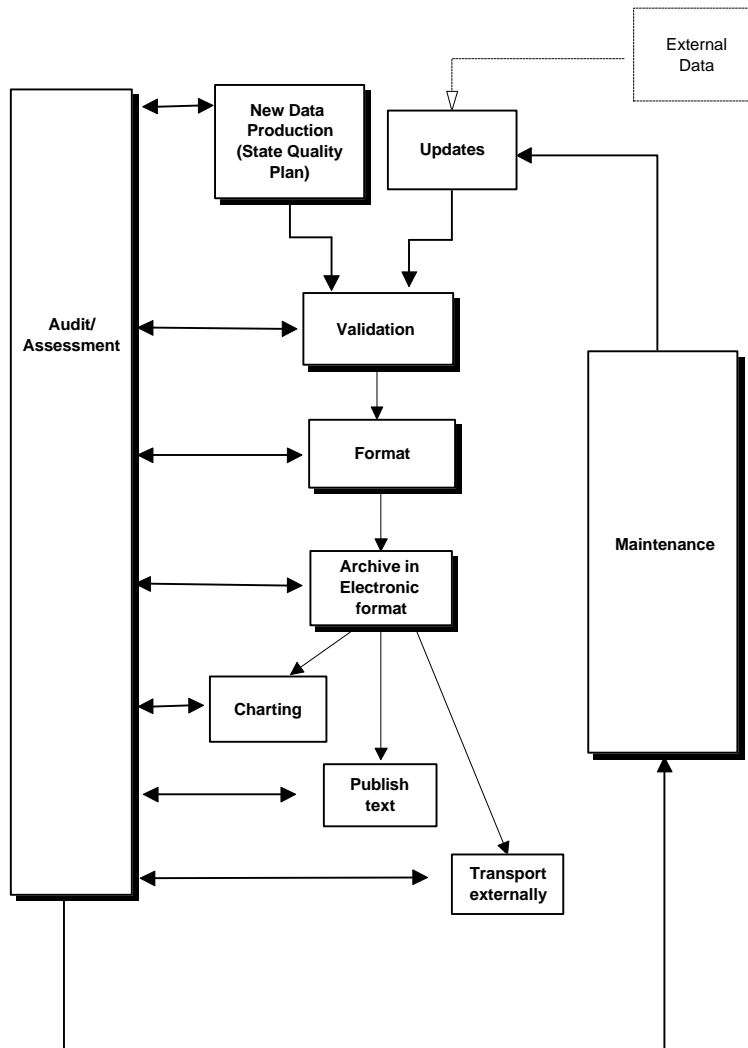


Figure 2

Each item shown in figure 2 could be developed as a quality plan having a similar structure to the SQP i.e. including its own quality control and internal assessment procedures. However an overall system review is still necessary to ensure that all the plans are functioning according to the requirements and policy of the Administration.

As with any quality system there needs to be commitment from all involved. A deficiency in one area is not necessarily countered by a better performance in another. Corrupt data output by a poorly performing unit at one stage will be assured its consistency when it passes on through other more effectively implemented QA procedures.

It must be noted that in this particular model system each plan is producing a product which may need to be validated on 'receipt' by the next module. At all stages the validity of the data produced should be established by the AIS team. For example in the case of the data acquisition phase. If the data is not 'secured' by application of some integrity measures, will the subsequent handling procedures avoid the possibility of an error? Similarly with any data received from external sources, such as shared points at boundaries. Has this data been received in a secured form? Should the data be validated according to internally developed rules? Approved software tools for checking validity and verification should be included. Development of a system which avoids re-entry of data is desired - electronic transfer by secure means.

There is an obvious advantage here in using a common and centrally controlled database. This would avoid duplication of storage and the possibility of missing updates to one or other of the copies. Many Administrations will probably be using software applications to store and manipulate data. Any databases or Geographical Information Systems in use must have validation rules to check manual data entry. Further rules need to be established that will ensure no unauthorised changes are made to databases. The disadvantage being that central control implies any errors will be propagated to all subsequent processes.

The 'maintenance plan' is of considerable importance as it is the 'vehicle' through which identified amendments and updates can be implemented. It is the plan that manages the data quality in the long term (i.e. time relevant). This has to be done through known procedures to ensure that the required alteration to data is correct and that notification of the changes are issued using an approved and efficient method. In fact the 'maintenance plan' would best serve as the basis of the principal quality system due to its relationship with all the other plans (figures 1 and 2). This can be pictured as in figure 3 where the validation, formatting, and distribution of the data etc., are either quality plans or procedures, depending on the size and complexity of the operation. The addition of assessment would then provide the structure of a quality system capable of maintaining or managing all the plans (figure 4).

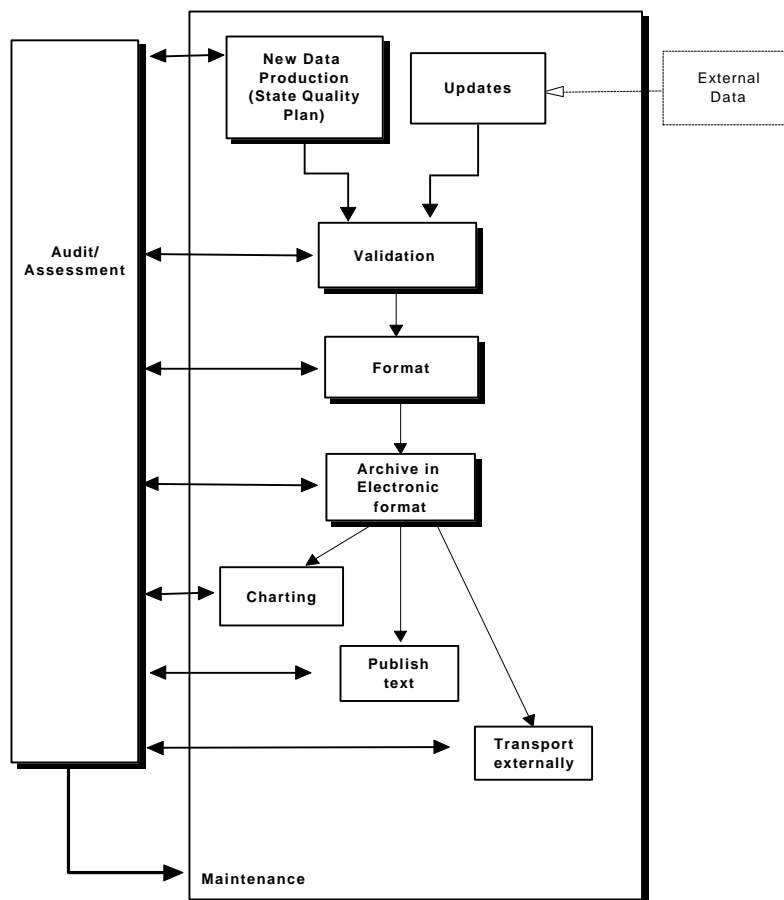


Figure 3

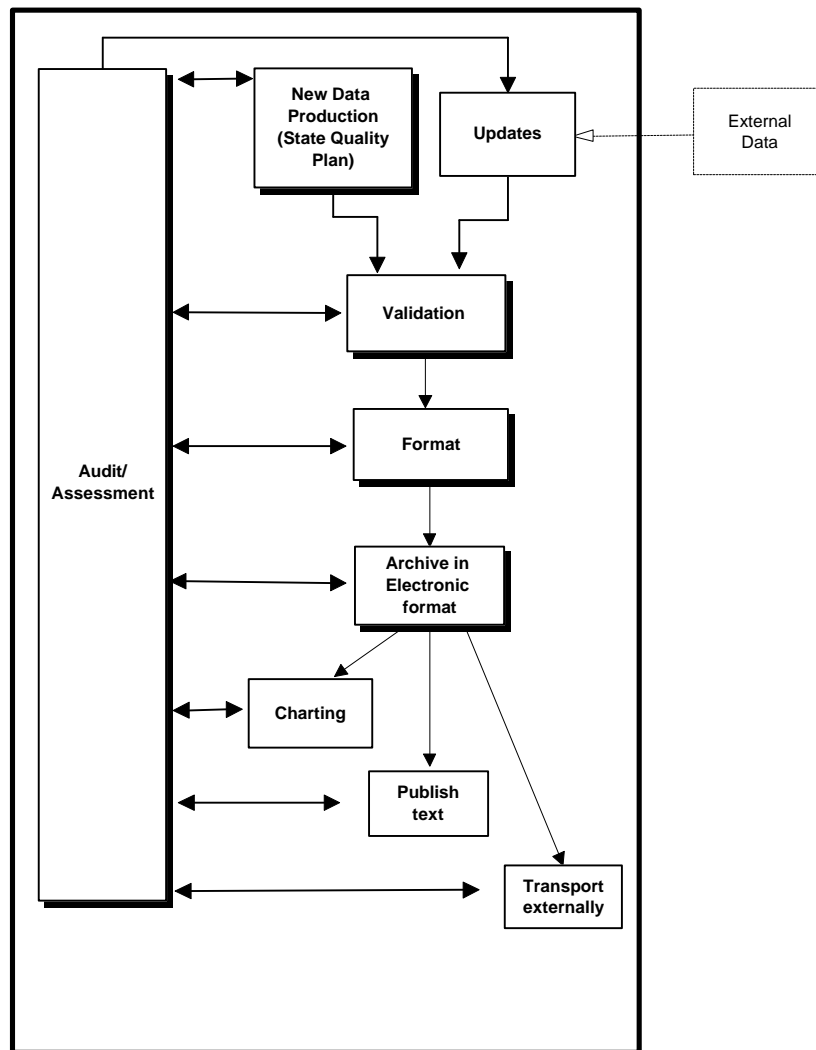


Figure 4

Standards

The State Quality Plan relies on the minimum specifications laid out in the EUROCONTROL Standard ‘Surveying Of Navigation Facilities’. This standard does not encompass the entire data management responsibility. Each quality plan described in the model is concerned with one sphere of the data management process, and as such has its own specific technical content which would require a set of specifications or its own standard.

Conclusion

The State Quality Plan has to be regarded as only one part of a quality system for the overall management of navigational data. To design such a comprehensive system, each Administration needs to first structure their entire data handling process identifying all the links between related operations. Each grouping of related tasks and responsibilities can be compiled as a quality plan which will need its own specific standard to meet the minimum technical requirements to be assured. Due to the nature of application of the product of the system (i.e. positional data), the design of the QMS needs to be efficient in time management - such as in the speed of updates and notification of amendments as well as consistency of output, data quality, integrity, and labelling. The aim being to establish a high level of confidence in the data product, for the user.