

Interface Control Procedures and Documentation

wht-naomi-73

Document number: AOW/GEN/RAH/2.1/02/98/ICD Documentation

1.0 Purpose and Scope

This document describes how interface control documents (ICDs) are produced and approved. For the purposes of interface control the NAOMI system, the William Herschel Telescope (WHT) and supporting facilities have been divided into various “subsystems” where the term “subsystem” has a very broad meaning. Section 3.0 lists these subsystems together with brief definitions and comments where appropriate. The project recognises that the subsystems defined for ICD purposes may not be suited for other NAOMI applications and there is no requirement to conform to this configuration for other applications. ICD formats for four types of interface are given in Section 4.0. Software interfaces will be addressed in a separate document.

2.0 Procedure

All required interface documents associated with each subsystem are listed in matrix form in the document number AOW/GEN/RAH/4.1/02/98/ICD Matrix. The current version defines the type of document required, i.e. electronics, mechanical, optical, facilities and software. Document numbers will be added later using the numbering system defined in Section 5.0. Each organisation is responsible for consulting the ICD matrix and preparing the applicable ICD(s). As the subsystems have been divided partly along organisational lines, preparation of an ICD will usually involve working closely with another organisation. Responsibility for the division of effort should be determined by the organisations involved, with a goal of sharing the total load about equally. Administrative problems should be referred to the project manager.

Table 1 specifies the responsibility for initiating the various ICDs. (The ING has been omitted from the table to avoid placing an excessive burden on its resources.) Local managers are responsible for insuring initiation but they may delegate the effort. As an interim measure the ATC has been substituted for RGO as the new organisation responsible for the WFS. All references to ROE have been replaced by the ATC. The requirement for interface documents between the WFS and the OMC has been left intact partly to emphasise the need for these documents, even though they may become internal ATC documents, and partly to allow for any future division of responsibility of the WFS work. This document will be modified if necessary when the organisational responsibilities for the WFS work have been clearly defined.

Table 1. Responsibility for ICD initiation.

Initiator

ICDs

Durham	a. DM to all other applicable subsystems. b. Electra to all other applicable subsystems c. RTCS to all applicable other subsystems except WFS-RTCS d. WFS to Electra.
ATC	WFS to all other applicable subsystems except Electra.
RGO	Science instrument (INGRID) and its CIA
ATC	All other subsystems not covered above.

The applicable subsystems in Table 1 are determined from the ICD matrix (document number AOW/GEN/RAH/4.1/02/98/ICD Matrix).

The ICD formats given in Section 4.0 shall be followed. All items must be addressed but if not applicable they need not be included in the interface document . Note that the “Other Requirements” section may be used in circumstances where the interface is not adequately covered by the normal entries. Approval is required from a representative of each organisation involved and the project engineer. (In the case of the interfaces between the WFS and OMC the term “organisation” refers to the groups responsible for each subsystem.) The representative may be the local manager or he may assign this responsibility. The ‘User’ is represented by the Project Scientist. Areas of responsibility are indicated in brackets () after the subsystem name. Where two sites are given, both must agree the change but the first mentioned has the primary responsibility.

When an ICD is complete, the project engineer will place it in an appropriate area on BSCW.

3.0 NAOMI Sub-systems

The abbreviations used in the subsystem headings are those given in the ICD matrix (Document number AOW/GEN/RAH/4.1/02/98/ICD Matrix).

3.1 WFS (ATC)

The WFS is the wavefront sensor that has been under development by RGO. For reasons given above the assumption was made that the responsibility for the WFS will pass to the ATC. The WFS camera and its controller are part of this subsystem.

3.2 OMC/ NCU (ATC)

This subsystem includes all components of the opto-mechanical chassis and Nasmyth calibration unit except the deformable mirror and the pre-correction camera. This subsystem is the responsibility of the ATC.

3.3 DM (ATC & Durham must both be consulted)

The DM is the Electra deformable mirror which will be supplied to the project by Durham University.

3.4 RTCS (Durham)

This subsystem includes all components of the real time control system except those incorporated from Electra.

3.5 Electra (Durham)

This subsystem refers to all components of the Electra RTCS used in NAOMI.

3.6 TCS (ING)

This subsystem is the WHT telescope control system.

3.7 CIA (ING)

The central intelligence agency refers to the control system for the science instrument. Interfaces with other subsystems are indicated in the ICD matrix.

3.8 Science Instrument (ING)

This instrument is the new infrared camera (INGRID) that has been under development at RGO. At present the goal is that INGRID should be completed at RGO.

3.9 Optical Science Port (ATC)

Present plans call for an acquisition camera at this port.

3.10 Pre-correction Camera (ATC)

This camera will be installed close to the Nasmyth focus. It will utilise a removable beamsplitter that is part of the NCU.

3.11 Telescope (ING)

This subsystem is the main telescope assembly but not its control system.

3.12 GHRIL Bench (ATC)

The OMC, NCU, DM and WFS are mounted on this bench.

3.13 GHRIL Control Room (ATC and ING)

This room is adjacent to the GHRIL bench and it will house various electronics racks for NAOMI.

3. 14 GHRIL Facility (ING and ATC)

This refers to the infrastructure needed to support operations at GHRIL. It includes all utilities and handling equipment including the dome cranes.

3.15 WHT Control Room (ING)

3.16 User (PS)

Although the user is not really a subsystem, this category has been included to insure that the needs of the user are satisfied, e.g. terminals are provided where needed.

4.0 ICD Formats

4.1 Electronics Interface

Document number and version: ICD/ELE/mmm/#.#/month/yr/title

Purpose and scope:

Approved by (Organisation A):	Date:
Approved by (Organisation B):	Date:
Approved by (PE):	Date:

Protocols:

Data rate

Signal levels:

Power supply requirement:

Rack location:

Terminal type:

Shielding/earthing arrangement:

Type of cable(s):

Length of cable(s):

Minimum bend radius:

Harnessing requirements:

Responsibility for cable preparation:

Connector type(s) (incl. M/F):

Subsystem A numbered pin diagram(s) :

Subsystem B numbered pin diagram(s) :

Other requirements

Revision history

4.2 Optical Interface

Document number and version: ICD/OPT/mmm/##/month/yr/title

Purpose and scope:

Approved by (Organisation A): Date:

Approved by (Organisation B): Date:

Approved by (PE): Date

Input beam requirements:

 Co-ordinates relative to Nasmyth focus and optical axis:

 f/ratio

 Field size

 Pupil location

 Pupil size

Output beam requirements:

 Co-ordinates relative to Nasmyth focus and optical axis:

 f/ratio:

 Field size:

 Pupil location:

 Pupil size:

 Beam quality:

Alignment aids required:

Other requirements:

Revision history:

4.3 Mechanical Interface

Document number and version: ICD/MEC/mmm/##/month/yr/title

Purpose and scope:

Approved by (Organisation A): Date:

Approved by (Organisation B): Date:

Approved by (PE): Date:

Interface drawing (attachment):

Materials of mating surfaces:

Surface finishes of mating surfaces:

Mounting procedure:

 Degrees of freedom:

 Adjustment tolerance(s):

 Adjustment method:

 Adjustment sequence (e.g. adj. A to B):

 Adjustment technique

Differential temperature / thermal effect tolerance(s):

Any safety precautions required:

Other requirements:

Revision history

4.4 Facility/Infrastructure Interface

Document number and version: ICD/FAC/mmm/##/month/yr/title

Purpose and scope:

Approved by: Date:

Utilities:

 Cooling system:

 Power:

 Air:

 Dry nitrogen:

 Helium:

 Lighting:

Handling equipment:

 Trolley:

 Weight:

 Crane:

 Lifting tackle:

Storage:

Safety:

Communications:

 Video links:

 Audio:

 Network(s):

 Serial ports:

Bench location:

Modification to bench:

GHRIL roof:

Dust protection:

Light protection:

EMC protection:

Alignment equipment (e.g. micro-alignment telescope, interferometer):

Revision history:

5.0 Document Numbering

The following numbering format shall be used:

ICD/nnn/mmm/##/month/yr/title (format sys1 to sys2)

where ICD replaces the standard AOW in the normal documentation system

nnn is one of OPT, MEC, ELE, FAC, SOF.

mmm is the author

is document number and version by that author on that nnn topic

title should include the (two) subsystems whose interface is being described, such as OMC to WFS, RTCS to DM.