WEC Detailed Data Handling
Software Project Management Plan

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December 15, 1999

Document Status Sheet			
1. Document Title: **WEC ISDAT Project Plan**			
2. Document Reference Number: **CWD-SPMP-001**			
3. Issue	4. Revision	5. Date	6. Reason for Change
Draft	0	93 September 08	New document
1	0	94 July 18	Changed to ESADOC style

Contents

1 Project definition

1.1 Objectives

The objectives of the ISDAT/WEC project is to provide software tools for Cluster WEC scientific data retrieval and presentation.

1.2 Deliverables

The following deliverables are required:

1. Software for data retrieval and presentation.
2. User manuals
3. Recommendations concerning hardware for ISDAT to be implemented on

1.3 Limits of the Project

1.3.1 Time limits

Start: Autumn 1993

End: 1. July 1998

1.3.2 Milestones

See Gantt chart in the Appendix

1.3.3 Other limits

The working group will use the existing working group report [Ref. 5] as a guide for its work.

1.4 Resources of the Project

There are no central resources allocated to the WEC/ISDAT development. The development depends entirely on contributions from the WEC member groups.

2 Project organisation

2.1 Project History

The development of the ISDAT software package for EFW applications was started several years ago within the CEDAS project.

The original objectives for the CEDAS project were given in a telex from F. Mozer to C.G.Fälthammar 4 March 1987. The project was discussed within the EFW team at a meeting at KTH in March 1987. At that meeting, it was agreed that the Swedish groups, IRF-U and KTH would take main responsibility for the coordination of the EFW data analysis software. It was also agreed that G. Holmgren should take the lead within the CEDAS project. Anders Lundgren was contracted to work as software engineer at IRF-U within the CEDAS project for a four years period from July 1988 to June 1992. In 1992, his contract was extended for another four years period July 1992 - June 1996. In July 1990, ESA released an Announcement of Opportunity (AO) [Ref. 1] for the provision of a European Cluster Science Data System (CSDS). A proposal to create a Scandinavian Data Centre (SDC) in Stockholm [Ref. 2] was submitted and accepted by ESA. The responsibility for the SDC was included in the CEDAS project.

At a WEC PI meeting in Uppsala in September 1992, a working group was appointed with the task to propose a model of how a coordinated data analysis within the WEC consortium could be achieved. At a WEC meeting in Meudon 13-14 May 1993, the working group report ([Ref. 5] was presented, and it was decided to use the ISDAT concept as the basic tool for detailed data analysis for all WEC instruments and to make a united effort to develop the analysis tools. As a concequence of that, we separate the basic ISDAT development from the CEDAS project.

2.2 Organisation Structure

The work will be organised in a coordinating working group with contacts mainly via e-mail. Gunnar Holmgren will chair the group, and Anders Lundgren will be responsible for the system design. In conflicting matters, the working group chair will contact the WEC coordinator or the WEC PI's for advise. Progress reports will be given at WEC team meetings. The working group has the following members:

Name	Affiliation		Remarks
Andrew Buckley	DWP		
Claude Delannoy	WHISPER	LPCE	
Christopher Harvey		OdP Meudon	French coordinator
Gunnar Holmgren	EFW	IRF-U	chairman of w/g
Arne Pedersen	WEC	ESTEC	WEC chairman
Anders Lundgren	EFW	IRF-U	system design
Claude deVilledary	STAFF	CRPE	
Michel Parrot	WHISPER	LPCE, Orleans	
Lesley Woolliscroft	DWP	USh	
Simon Walker	DWP	USh	
Richard Huff	WBD		
Björn Lybekk	EFW	UiO	Graphics
Mikael Thomsen		ESTEC	Graphics

Table 1: WECdata working group members

3 Product description

The product requirements are given in the WEC User Requirements Document [Ref. 4].

4 Implementation plan

4.1 Development model

The prototype development of the ISDAT system started in July 1988. As a prototype, it has been tested on several projects like Viking, EISCAT, ground based magnetometers and magnetometers, Cluster EFW, STAFF, WBD ground tests, and notably on Freja. It has also been tested on several UNIX platforms like: SUN Sparc station I, HP 9000 series, at several institutions like: IRF-U, CRPE, FMI, IRF-Um, RAL etc. ISDAT version 1.0 will be tested and released in the end of 1993, and it will be extensively used on the Freja F4 data analysis.

For the WEC use, the development will be based on version 1, and the adjustments to WEC applications will start by extending the User Requirements document to include additional WEC requirements. After a WEC approval of the WEC/ISDAT URD [Ref. 4], the necessary system design modifications will be identified, and additional subsystems, libraries and general clients will be identified by the working group. The identified modifications and extensions will be presented to the WEC team, and the implementation work will be distributed among the WEC groups.

4.2 Development resources

4.2.1 Manpower

There will be no central resources for the WEC/ISDAT development, nor will there be any overall estimates made of required manpower. All necessary resources have to be provided by the WEC institutions, and the contributions will be in terms of contributed WEC/ISDAT components, not in terms of manpower or other resources. The realisation will thus depend on the ability of the WEC consortium to provide enough contributions.

4.2.2 Hardware and software

It is up to the participating institutions to provide their own UNIX platforms, as well as necessary software packages for the development and execution of the software. The use of commercial software will be avoided as far as possible.

4.2.3 Computer networks

The working group will work mainly via electronic mail and other network services. It is thus necessary that contributing institutions have good network connections.

4.2.4 Travel

Working group meetings will be kept to a minimum. It will, however not be possible to completely avoid travels. All travel expenses have to be covered by the participants.

4.3 Software and Documentation standards

See the relevant ISDAT documents.

4.4 Contingency plan

4.4.1 Assumptions:

- Funding is provided by national agencies
- Manpower is supplied by participating institutions
- Development environments are supplied by the institutions

4.4.2 Risks

- Exchange of people working within the project.
- Conflicts due to the lack of a centralised budget.
  This risk can be minimised by a clear division of responsibilities.
- Management problems due to the multi-institutional organisation. This risk can be minimised by a clear division of responsibilities.

4.5 Development schedule

The Gantt diagram is included as an Appendix.

5 Quality assurance plan

The basic ISDAT system quality is assured by the extensive use of ISDAT version 1 prior to the WEC extensions. The quality of the WEC extensions are assured via regular reviews at WEC team meetings, and the active engagement by all WEC instrument teams in the systm development. In addition, regular software development practice will be used.

5.1 Project documents

The documents are listed in the documentation plan [Ref. 3].

5.2 Test Strategy

The test strategy will be described in a test plan (see [Ref. 3]).

5.3 Review procedure

There will be no formal reviews. However, progress will be reported to the WEC team meetings.

5.4 Project meetings

Project meetings will be kept to a minimum. Most of the working group communications will be made via electronic mail.

References

[1] CSDS Cluster science data system, announcement of opportunity. Technical report, ESA, December 1990.

[2] G. Holmgren. A proposal for a scandinavian data centre for the Cluster mission. Technical report, IRF-U, December 1990.

[3] G. Holmgren. WEC detailed data analysis software, documentation plan. Technical Report CWD-SDP-001, July 1994.

[4] G. Holmgren. WEC detailed data analysis software. user requirements. Technical Report CWD-URD-001, IRF-U, February 1994.

[5] WECdata working group. Cluster WEC detailed scientific data handling. working group report to wec. Technical report, IRF-U, May 1993.

A Schedule

B Acronyms

Acronym	Meaning
AO	Announcement of Opportunity
ASPOC	Active Spacecraft Potential Control; a WEC Cluster Instrument
C	A programming language
CC	Calibration and Commanding
CDR	Conceptual Design Review
CEDAS	Cluster EFW Data Analysis System
CNES	Centre National d'Etudes Spatiales
CoI	Coinvestigator
CDDS	Cluster Data Disposition System
CDDS file	New notation for SHF
CSDC	Cluster Science data Centre, old notation, now CSDS
CSDS	Cluster Science data System, replaces CSDC
CUI	Cornell University, Ithaca
CRPE	
DBH	Data Base Handler
DD	Data Distribution
DEC	Digital Equipment Corporation
EFW	Electric Field and Wave Experiment
EGSE	Electrical Ground Station Equipment; on WEC level
EID	Electrical Interface Document
ESA	European Space Agency
ESANET	European Space Agency Network
ESIS	European Space Information System
ESOC	European Space Operations Centre, Darmstadt, Germany
ESTEC	European Space Technology Centre, Nordwijk, Holland
FFT	Fast Fourier Transform
FORTRAN	FORmula TRANslator
GB	Giga-byte
GSE	Ground Station Equipment
GSFC	Goddard Space Flight Center
GSFC/LEP	GSFC / Laboratory for Extraterrestrial Physics
HP	Hewlett Packard
IRF-U	Institutet för Rymdfysik, Uppsalaavdelningen
	Swedish Inst. of Space Phys., Uppsala Division
ISTP	International Solar Terrestrial Program
	NASA name for Cluster SOHO and other scientific missions
IKI	Institut Kosmicheskikh Issledovanij
	Space Research Institute, Moscow
IMF	Interplanetary Magnetic Field

Table 2: Acronyms part 1

Acronym	Meaning
ISDAT	Interactive Satellite Data Analysis Tool
JSOC	Joint Science Operations Centre
KTH	Kungliga Tekniska högskolan Royal Institute of Technology, Stockholm
LPCE	
MB	Mega-byte
MoU	Memorandum of Understanding
OdP	Observatoire de Paris
OSF	Open Software Foundation
PC	Personal Computer
PI	Principal Investigator
PPDB	Prime Parameter Data base
RDM	Raw Data Medium
SDC	Scandinavian Data Centre
SHF	Short History File
SOC	Science Operation Centre
SPAN	Space Physics Analysis Network
SPDB	Summary Parameter Data Base
SSC	Satellite Situation Centre
STSP	Solar Terrestrial Science Program ESA name for Cluster SOHO missions
SWT	Science Working Team; on Cluster level
TBD	To be defined
UCB	University of California at Berkeley
UCB/SSL	UCB / Space Science Laboratiory
USh	University of Sheffield
UiO	Universitetet i Oslo University of Oslo
WBD	Wide Band Data; A member experiment of WEC
WEC	Wave Experiment Consortium; EFW is a member of WEC
WHISPER	Waves of High Frequency and Sounder for Probing of the Electron Density by Relaxation; a WEC Cluster instrument
X11	X-Windows, revision 11; Component in OSF
h/w	hardware
s/w	software

Table 3: Acronyms cnt'd