FP6 PROJECT
REVIEW Report

	Individual report
X	**Consolidated report**

Thematic Priority/Activity	Research Infrastructures
Instrument type	I3
Project no and acronym	026642 EXPReS
Project full title	Express Production Real-time e-VLBI Service
Project start date	01/03/2006
Project duration	48 Months – end date 31/08/2009
Project coordinator name and organisation	Huib Jan van Langevelde - JIVE
Period covered by report (from – to)	01/03/2008 to 31/08/2009
Date of (review) meeting	18/11/2009
Name(s) of reviewer(s)	Fulvio Casali Victor Castelo Kenneth Kellermann
Name of reviewer drafting the report	

Introduction

This template provides the structure for the review report that needs to be prepared after the project review.

In completing Sections 2-8 of the report, independent reviewers should keep in mind that, in case they feel that they do not have the competence or the information to answer a question, they do not need to tick any of the boxes 'Yes', 'Partially', 'No' for that question, but they must complete the 'Comments' box.

If several reviewers are involved, it is preferable that a consolidated report be prepared by one reviewer chosen as 'rapporteur'.

The reporting requirements for FP6 projects are described in detail in the "Guidance notes on Project reporting in FP6" (downloadable from http://www.cordis.lu/fp6/find-doc-management.htm#reporting).

Questions to be answered by the reviewer(s)

1. OVERALL ASSESSMENT

a. Executive summary
Please follow the order of the individual sections of this report

Comments:

This report follows the third and final review, covering the period 1st March 2008 to 31 August 2009 which includs a no cost extension of 6 months..

EXPReS (EXpress Production Real-time e-VLBI Service) employs high-speed communication networks in order to create a globally distributed, large-scale astronomical instrument of continental and inter-continental dimensions, a Very Long Baseline Interferometer (VLBI) operating in real-time, and connecting together some of the largest and most sensitive radio telescopes on the planet.

The Express project has been extraordinarily successful in bringing together diverse radio telescope facilities to achieve real time correlation at data rates up to 1024 Mbps. Both scheduled and triggered observing opportunities are made available to the global radio astronomy community. Probably all of the published astronomical results would have been possible with conventional disk recording, but the success of Express will inform the design of future facilities such as the SKA.

This project has represented a successful example of how multidisciplinary projects can facilitate the collaboration among different scientific areas, such as astronomers, hardware and software engineers and networking engineers. The project has also proven how the availability of broadband networks makes possible challenging collaborations such as those with Russian and Chinese colleagues..

X	Good to excellent project (The project has fully achieved its objectives and technical goals for the period and has even exceeded expectations)
	Acceptable project (The project has achieved most of its objectives and technical goals for the period with relatively minor deviations)
	Unsatisfactory project (The project has failed to achieve critical objectives and/or is not at all on schedule)

b. Recommendations

1. Retain the valuable resources established as possible
2. Maintain the website
3. Have technical publications in recognized peer reviewed journals

Recommendation for the future
The reviewers were impressed by the progresses made and believe the project should explore any opportunity for further development, with the objective of maintaining the momentum developed through EXPReS.

2. OBJECTIVES

a. Have the objectives for the period been achieved?

[X] Yes	[ ] Partially	[ ] No

Comments:

All major scientific and technical/networking objectives have been achieved. Only exception: the telescope in Sardinia has not been completed during the Express period and so the planned connection was not established.
The target transmission speed of 16Gbps has not been achieved largely due to the delayed completion of the eMERLIN correlator and may represent an objective for the future.

b. Are the overall objectives (i) still relevant and (ii) still achievable within the time and resources available to the project?

(i)

[ ] Yes	[ ] Partially	[ ] No

(ii)

[ ] Yes	[ ] Partially	[ ] No

Comments:

N.A.

c. Do you recommend changes in objectives in order to keep up with the current state-of-the-art?

[ ] Yes	[ ] Partially	[ ] No

Comments:

N.A.

3. WORKPLAN AND RESOURCES

a. Has the project as a whole been making satisfactory progress in relation to the Description of Work (Annex I to the contract)?

[X] Yes	[ ] Partially	[ ] No

Comments:

The reviewers were impressed by the technical and organizational achievements as well as by the strong collaborative spirit that has made eVLBI a reality.

b. Has each work package (WP) been making satisfactory progress in relation to the Description of Work (Annex I to the contract)?

[X] Yes	[ ] Partially	[ ] No

Comments:

NA1, NA2, NA3, NA4: The progress of aspects as the management, networking of radio astronomery community and NRENs (EVN-NRENs forum), support of eVSAG activities, and the dissemination work, have been satisfactory developed.
SA1: e-VLBI operational improvements using telescopes on all the continents, increasing the data rate beyond 1 Gbps (until 5 stations). Achieving fast response in regular and triggered observations. Deployed a reliable network.
SA2: Important connections of Effelsberg and Yebes telescopes. Only problems with Sardinia telescope local loop, which will be ready in 2010.
JRA1: Test of distributed computing using 2 clusters for correlation. New high performance correlation software developed. Considerable progress in the of eMERLIN interface cards. Important achievements in the real time and data storage. The record correlator speed was established as 6 Gbps.

c. Have planned milestones and deliverables been achieved for the reporting period?

[X] Yes	[ ] Partially	[ ] No

Comments:

Several milestones were not met for reasons outside the project responsibility, namely: the Sardinia feasibility study due to the telescope non readiness, the connection to HRAO due to a mechanical failure of the telescope, and the 10 Gbps link between MERLIN and JIVE which was delayed as a result of the late delivery of some MERLIN correlator components.

d. Have resources been deployed as foreseen in Annex I, overall and for each participant?

☐ Yes	☒ Partially	☐ No

Comments:

The overall resource budget has been properly allocated with small deviations at the level of the individual participants, which were budget neutral.

e. Have costs incurred, i.e., personnel costs and other major cost items, been 1) necessary for the implementation of the project and 2) economic. Note that both aspects 1) and 2) have to be covered in the answer.

☒ Yes	☐ Partially	☐ No

Comments:

Personnel costs and all major cost items were justified and were carefully managed in an economic way.

4. WORK PLANNED FOR THE NEXT 18-MONTH PERIOD

Is the proposed update to the *Implementation Plan* for the next 18-month period satisfactory

a. from a scientific/technical point of view?

☐ Yes	☐ Partially	☐ No

Comments:

N.A.

b. from a management point of view including use of resources?

☐ Yes	☐ Partially	☐ No

Comments:

N.A.

c. concerning non-scientific activities (dissemination, exploitation, training, science-society issues, further integration etc)?

☒ Yes	☐ Partially	☐ No

Comments:

N.A.

5. CONSORTIUM PARTNERSHIP

a. Has the collaboration between the participants been effective?

[X] Yes	[ ] Partially	[ ] No

Comments:

The scientific community has a long record of effective collaboration. The EXPReS project was an extension of this long lasting collaboration. This case has been a good example of the collaboration among different scientific areas: astronomers, hardware and software engineers, and the networking people. The cooperation with Russian and Chinese colleagues was especially challenging.

b. Have the partners contributed as planned to the project and tasks assigned to them?

[ ] Yes	[X] Partially	[ ] No

Comments:

For the most part, the partners have fulfilled their responsibilities except in a few cases due to events beyond the control of the partners such as the failure of the telescope in South Africa and the late delivery of crucial components needed for the eMERLIN correlator.

c. Do you identify any conflicts or evidence of underperforming partners, lack of commitment or change of interest of any partners? Do you recommend any changes in responsibilities?

[ ] Yes	[ ] Partially	[X] No

Comments:

No problems have been identified.

6. MANAGEMENT

a. Has the scientific/technical management been performed as required?

[X] Yes	[ ] Partially	[ ] No

Comments:

The management has reacted rapidly and effectively to unexpected issues such as a mismatch between operational entity and legally registered entity in Spain and network price changes in several countries.
Moreover they promoted a e-STAG advisory group that participated and took a leadership in standardization actions (VDIF)

b. Has the administrative and financial management been performed as required ((including proper handling of contractual matters, maintenance of the consortium agreement, intellectual property rights, technical collective responsibility, sub-contracting, competitive calls)?

[X] Yes	[ ] Partially	[ ] No

Comments:

Some participants are still undergoing the Audit activity, but this does not raise any concern.

c. Have (electronic) information and communication networks been established as required to support interactive working between the teams involved (if relevant)?

[X] Yes	[ ] Partially	[ ] No

Comments:

The project made good use of collaborative tools, mainly EVO a Java multiplatform collaborative application developed by Caltech. The wiki have been also used as a way to interexchange information about the progress of the project.

d. Is the consortium interacting in a satisfactory manner with other related 5th and 6th Framework projects or other R&D national/international programmes?

[X] Yes	[ ] Partially	[ ] No

Comments:

The project achieved a very promising interdisciplinary collaboration between radio astronomers and network and computing engineers.

7. USE AND DISSEMINATION OF KNOWLEDGE

a. Does the project have significant use potential?

[X] Yes	[ ] Partially	[ ] No

Comments:

The project has a very significant use potentials demonstrated by the broad user community and the potential application to future facilities such as the SKA.

b. Is the Plan for the Use and Dissemination of Knowledge developing in a satisfactory manner?

[X] Yes	[ ] Partially	[ ] No

Comments:

The project organized a substantial number of events and has produced high quality papers. The utilization of the networks has been used by the NRENs as a clear success case. The web pages have been complemented with a more interactive wiki.

There are very interesting examples: Astronomers Telegrams issued, publications in the refereed scientific literature, conference reports, as well as demonstrations as the opening of the International Year of Astronomy and the "100 hours of Astronomy".

c. Have the contractors disseminated project results and information as foreseen by the contract and the plan for dissemination and use of knowledge (publications, conferences…)?

[x] Yes	[ ] Partially	[ ] No

Comments:

Perhaps the impact can be improved with more publications in refereed journals such as IEEE Transactions, which are read by a broad audience.

d. Are potential users and other stakeholders (outside the consortium) suitably involved (if applicable)?

[X] Yes	[ ] Partially	[ ] No

Comments:

Most partners are also users, although the user community extends well beyond the partners.
The SKA is also a potential user.

8. OTHER ISSUES

a. Have policy-related and/or regulatory issues been properly handled (if applicable)?

[X] Yes	[ ] Partially	[ ] No

Comments:

Policy related and data integrity issues have been properly dealt with.

b. Have ethical issues been appropriately handled (if applicable)?

[X] Yes	[ ] Partially	[ ] No

Comments:

N.A.

c. Have safety issues been properly handled (if applicable)?

[X] Yes	[ ] Partially	[ ] No

Comments:

d. Has progress on the Gender Action Plan been satisfactory (if applicable for this reporting period)?

[ ] Yes	[ ] Partially	[ ] No

Comments:

N.A.

Name (s) of the reviewer(s): Fulvio Casali Date: Signature(s):

Name (s) of the reviewer(s): Victor Castelo Date: Signature(s):

Name (s) of the reviewer(s): Kenneth Kellermann Date: Signature(s):