

Status of the RINAF project

Phase 1

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*L. Abba***, *A. Gebrehiwot**, *A. Lazzaroni**, *S. Trumpy***

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** CNUCE-CNR

* Consorzio Pisa Ricerche - RINAF staff

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Introduction

The RINAF (Regional Informatics Network for Africa) project was conceived by the Intergovernmental Informatics Program (IIP) of UNESCO and financed by a grant of the Italian Government and by a contribution from the Republic of Korea; the project implementation phase was started in the second half of 1992 and is planned to last till the end of 1994.

Decisions regarding grants currently made available from the Italian Government are taken by the Steering Committee, which will operate for a period of two years in order to carry out the project goals. An African Committee was set up for the approval of all actions to be taken in order to get the best advantage of the available funds; the African Committee, which is destined to survive to the RINAF project, will represent a forum whereby the African regions define the status of utilisation of information technology means in their countries along with the requirements within the RINAF project.

Stefano Trumpy, Director of the CNUCE Institute of the Italian National Council of Research (CNR), has been nominated Technical Coordinator of the RINAF Project. The task of the Technical Coordinator is to propose a set of initiatives and investments to the African Committee, based on the knowledge of the situation concerning network infrastructure and computer usage in the African countries. A structure has been set up in Pisa which supports the Technical Coordinator in taking the initiatives, testing the technical solutions and starting the training activities.

The project is meant to bring basic Internet services (e-mail, bulletin boards, access to data bases, discussion lists, etc.) to several African countries. The plan is to establish five regional nodes and ten national nodes. RINAF relies on the cooperation with other initiatives operating in the African continent like the IDRC-Canada project, the RIO network of ORSTOM-France and other existing network initiatives; therefore, the protocols used and the technical solutions adopted have to be heterogeneous in order to get the maximum result from the project.

Interaction with the RINAF focal points

One of the most important RINAF actions and a fundamental key for success is the establishment of competences and structures capable of running the services. Moreover the sensitization of user groups, financing bodies and politicians will be prove to be of great relevance to assure the sustainability of the services that RINAF will contribute to start. For this reason the Country Coordinators are playing a key role for the success of RINAF in their countries.

The RINAF initiatives have been concentrated so far on the 4+1 regional nodes (in the first implementation phase Nigeria was initially defined as a national node but is bound to assume the functions of a regional node during the second phase).

The relevant steps for the implementation of the project in a country have been the following:

- 1) appointment of the RINAF Country Coordinator (not always so easy; see the case of Kenya);
- 2) the Technical Coordinator starts his interaction with the appointed Country Coordinator in order to help him:
 - appointing a national Technical Responsible;
 - selecting at least two technicians to be trained as system operators;
 - preparing a RINAF plan;
 - setting up a national committee/s to promote and increase the user base.
- 3) The Technical Coordinator and the Country Coordinator agree on a feasible implementation plan which makes the most appropriate use of the RINAF funds taking into account the following aspects:
 - available equipment;
 - presence of cooperating initiatives/projects in the country;
 - situation of the telephone system in the country;
 - existence of a first nucleus of users;
 - existing know-how.
- 4) The RINAF staff carries on with the acquisition and shipment of the equipment after having examined various offers.
- 5) The training activities and the on-site training take place

Status of the nodes implementation

The division of the African countries into five main regions has been agreed by the African Committee as follows:

NORTH	WEST	CENTER	EAST	SOUTH
ALGERIA	SENEGAL	NIGERIA	KENYA	ZAMBIA
Morocco Tunisia Mauritania Egypt Libya Sudan	Gambia Guinea Bissau Guinea Liberia Ivory Coast Burkina-Faso Mali Cap Vert Niger	Cameroun Central Africa Guinea Eq. Sao Tome Gabon Congo Zaire Benin Togo Ghana Sierra Leone Chad	Djibouti Ethiopia Somalia Uganda Ruanda Burundi Tanzania Madagascar Comoros Seychelles Mauritius	Zimbabwe Namibia Malawi Angola Swaziland Lesotho Botswana Mozambique

The RINAF Steering Committee decided in Paris, on the 1st July 1992, to start eight nodes in the following countries: Algeria, Egypt, Guinea, Kenya, Nigeria, Senegal, Swaziland and Zambia. Since the beginning, the nodes of Algeria, Kenya, Senegal and Zambia were intended to have regional functions; the nodes of Guinea, Swaziland and Egypt were intended to be national nodes; the node of Nigeria was planned, at the beginning, as a national node and a migration to regional functions would have been realised later, according to the situation's development.

Regional nodes status

The planning and implementation of the quoted nodes is the following (the related annexes give an overview of all the activities which have been carried out so far for each node within the project, supplying details on the single implementation plans, on the acquisition of equipment, installation, progress report and training activity).

Algeria (CERIST)

The RINAF Country Coordinator is Mr. M. Benhamadi, Director of CERIST and member of the African Committee. The first phase of the implementation plan has been completed; the equipment requested has been supplied and a leased line between CERIST and CNUCE has been activated on the 11th of January 1994 giving all Internet services using the TCP/IP protocol (Annex 1)

Senegal (CNDST)

The RINAF Country Coordinator is Mr. M. Ali Ndiaye, "Delegué à l'Informatique du Ministère de la Modernisation de l'Etat et de la Technologie". The Technical Responsible function is carried out by Mr. Fadel Diagne, Director of the CNDST, and by Mr. Moustapha Ndiaye of the same Ministry as Mr. Ali Ndiaye. In order to start the node in Senegal, a cooperation has been activated with the RIO node of ORSTOM in Dakar. This cooperation envisages a training activity for the RINAF system operators and the installation of 11 points of access to the RIO network. A plan for the activation of the RINAF nodes has been agreed and the equipment requested has already been purchased and sent to CNDST. The node is presently connected and functioning (Annex 2).

Kenya (NCST and Moi University)

Dr. J.B. Ojambo, from the Faculty of Information Sciences of the Moi University, has been appointed as Country Coordinator. A plan for the activation of the RINAF activities in Kenya has been agreed with the Technical Coordinator and has been put in place. The equipment requested has been sent to Kenya in October '93 and it is still waiting to be installed.

The Technical Responsible role is carried out by Shem Ochuodho of the University of Nairobi and by Thomas Afullo of the Moi University. A National Committee for networking, chaired by Prof. Ogallo (Secretary of the National Council for Science and Technology), and of which Dr. Ojiambo is a member, has been set up (Annex 3).

Zambia (University of Zambia)

The RINAF Country Coordinator is Mark Bennett, Director of the Computer Centre at the University of Zambia, who is also the Technical Responsible. A plan to improve the present status of network services for the research area in Zambia, has been agreed and executed. The equipment requested has already been supplied and installed and the node is functioning (Annex 4).

Nigeria (NCTM - Obafemi Awolowo University)

Prof. A. Sanni, Executive Director of the National Centre for Technology Management located at the Obafemi Awolowo University in Ile-Ife, has been appointed as RINAF Country Coordinator for Nigeria. At present, the main node at the Yaba College of Technology is operational through a UUCP protocol using the equipment supplied by RINAF; regular dial-up connections are made by CNUCE for uploading and downloading e-mail messages. Nigeria is planned to become a regional node. Since there was no network activity running in Nigeria, the initial RINAF plan was to start with a first low level solution, typical of a national node, to be located in a site with some expertise, and to

upgrade the solution after the location and the organization of the regional node was defined. A plan for the activation of the regional node has been submitted and the equipment requested has been sent to the final destination (Annex 5).

National nodes

Egypt (ENSTINET/FRCU)

Since a bilateral agreement between Italy and Egypt aimed to create an international network centre in Mubarak City (near Alexandria) is about to start, there will not be a technical solution to charge on RINAF budget. The realisation of this plan will grant Egypt a more relevant role than the one of a national node. The RINAF activity is being defined with ENSTINET in co-operation with FRCU in Cairo which holds the international leased line to France connected to the EARN network. The RINAF Country Coordinator is Mr. A. Bassit, Director of ENSTINET. The Technical Responsible are: Mr. Maged Boulos from ENSTINET and Ms. Nashwa Abdel Bakry from FRCU.

Guinea (Centre Informatique - Université de Conakry)

The RINAF Country Coordinator is Mr. Tierno Bah, professor on leave of the Conakry University and President of the Guinea* Access company. The Technical Responsible is Mr. Boubacar Sako of the Conakry University. A plan was prepared for a radio link solution in order to bring the data network services in the country. This solution appears to be the only feasible one since the telephone system is broken or unreliable. Since the support requested from RINAF is part of a larger plan aimed to bring TLC services in the commercial environment, the RINAF actions are suspended until the situation appears more feasible and reliable.

Swaziland (Computer Centre - Manzini University)

The RINAF Country Coordinator is Mr. Paulos Kunene of the University of Swaziland. The Technical Responsible is Mr. Eelco Vriezokolk of the University of Swaziland. Following to some recent contacts, the Technical Responsible has shown the willingness of soon submitting a revised plan for the node activation (Annex 4).

Role of the national and regional nodes

The RINAF project is encouraging the communications within the single regions; the regional nodes have a promoting role for this purpose, by supplying information and data bases, training and support to the users; RINAF encourages the interregional communications and to this objective the regional nodes should play a major role. RINAF provides not only efficient connections to Europe and America but also supply frequent and efficient means of communication and of exchanging data between African countries. Provided that the data path is transparent to the users, the goal of RINAF is to assure a good intercommunication between African countries despite the often bad quality of the international telecommunication means in Africa.

We can certainly say that the aim of inserting the African countries in the community of Internet, which is opening to a fast growing number of developing countries, has been prevailing; the Internet environment is infact providing technical tools which allow the users to interact in the best cost-effective way with any other user in the network, regardless of the physical path followed by the data.

The key factor for reaching the goal of RINAF, as well as any other networking initiative aimed to reach a global connectivity, has been to create a group of good african technicians who should be able to promote the network and the user services but also to manage the network complexity, working with the Internet technicians spread out in the world. This group of African technicians has been trained to take advantage of the existing links to Internet in order to guarantee a good level of the service, to select alternative paths when the main links are failing and to deal with queuing problems. They have also been trained to maintain a structure which, due to the african economic situation, is based on standard and consolidated technological solutions but which still encounters difficulties related to the minor redundancy of equipment, to the lack of specialized personnel, to the difficulties in getting support from the hardware and software manufacturers, etc. Therefore we confirm the primary objective of creating a first class group of technicians; the RINAF Country Coordinators are aware of the importance of carefully selecting the network technicians possibly providing them with an adequate position, in order to avoid their following departing.

Training activities

The formation of a group of technicians in charge with the management of the RINAF nodes and with the training of the potential users, has been considered a key factor for the

success of RINAF. The training courses carried out within the project have been the following:

a) RINAF course for system operators: Pisa, 26th October-6th November 1992

The course has been attended by two delegates for each of the 8 RINAF nodes along with a delegate from Tunisia, one from Uganda and another from Kenya. The total number of attendees was 19.

The teachers guaranteed a very high level of expertise and supplied some good written material for further consultation.

The course attendees after one week of intensive course, took part to the international conference on network services, NSC '92 held in Pisa, which represented an ideal situation for the integration of the African representatives in the international arena, stimulating them to interact with their European and American colleagues.

The participants worked very hard in the time left after the lessons and prepared a valuable set of documents which constitute the base for the implementation of RINAF.

b) Regional courses in Africa

Five regional courses will be organized within the project. The RINAF Technical Coordinator is prepared to make agreements with the Regional Coordinators in order to shape the course agreeing on the following points:

- 1) dates and duration of the courses (from 3 to 5 days);
- 2) program of the course (to be agreed in accordance with the technological solutions adopted by RINAF in the region);
- 3) teachers (if possible one coming from the region hosting the course);
- 4) selection of the trainees (the optimal number should be 20);
- 5) budgetary issues;
- 6) organizative aspects.

The first regional course for system operators has taken place in conjunction with the "Helina '93" conference held in Ile-Ife, Nigeria, on 19-23 April. The three days course, which has seen the participation of 20 delegates coming from the central and western part of the African continent, concentrated on Fidonet and UUCP technologies along with some hands on practice sessions. The RINAF Technical Coordinator, Mr. Stefano Trumpy, attended the course as a teacher and coordinating person. The course was also the occasion to train the system operators to start the nodes activity in Nigeria.

The remaining courses will take place in locations and at a time to be determined.

c) On site training and assistance to the RINAF nodes

Each node will require a specific training for the installation and for site assistance in order to start the operations and activate the services; this activity has already been carried out in Algeria, Egypt and Nigeria.

Participation to the INET conferences and workshops for developing countries

In 1991 the Internet environment started the organization of worldwide conferences dealing with global networking issues; special events have been organized in conjunction to help developing countries to connect to Internet.

1) INET '91

Seven African delegates were invited, on the initiative of the CNUCE Institute, to the conference which took place in Copenaghen.

2) INET '92

15 RINAF delegates from various African countries participated to the conference held in Kobe, Japan, on 15-18 June 1992 which was preceded by two days workshop and tutorials for developing nations. The article "RINAF: a network interconnection project of academic and research institutions in Africa" was presented by the Technical Coordinator Mr. Stefano Trumpy.

3) INET '93

22 RINAF representatives of African nationality participated to the INET'93 Conference and to the one week Workshop for Developing Countries held in San Francisco 10-20 August 1993. The RINAF contribution has been integrated with more grants provided by the Internet Society in order to assure the full costs coverage for the African delegates who applied for financial aid (almost all). Priority has been given to the African countries hosting a regional or a national node and to persons permanently resident in Africa.

Participation of RINAF representatives to events concerning data networks in the African continent

RINAF has participated to some of the main events in order to publicise the project and to establish a synergism with the existing networking activities. The participation of RINAF representatives to the INET conferences demonstrated the importance of being actively present in the most important events concerning networking activities in developing countries and particularly in Africa. RINAF has been officially invited to take part to the following events, where a RINAF representative presented an article on the project:

- 1) "International Workshop on Digital Radio Technology And Applications", organised by the International Development Research Centre (IDRC- Canada) and Volunteers in Technical Assistance (VITA). The workshop took place in Nairobi, Kenya, on 24-26 August 1992.

From the 27th to the 29th of August, the "Workshop on Science and Technology Communication Networks in Africa" organised by the African Academy of Science and by the American Association for the Advancement of Sciences was held in the same place.

Mr. Stefano Trumpy attended the two events as a representative of the RINAF project presenting the article: "RINAF: a network interconnection project of academic and research institutions in Africa". The meeting has been relevant for the relationships established with some representatives and operating associations of the African continent in order to create data networks in Africa. A book of the proceedings has been prepared by AAAS; it gives a good overview of the situation in Africa regarding data networking.

- 2) Workshop "Africon 92" organized by IEEE which took place in Swaziland on 22-24 September 1992. The RINAF project was represented by Prof. Enzo Dalle Mese from the Computer Engineering Department of the University of Pisa, who was the co-author of the article: "The RINAF project: a computer networks interconnection of the African countries"

- 3) "1st African Conference on Research in Computer Science" organised by INRIA and United Nations University which was held in Yaoundé, Cameroun, October 14-20, 1992.

The RINAF project was represented by Dr. Daniel Mbeng, a Cameroun citizen presently working in a software house in Pisa which kindly let him fulfil a part-time

engagement for RINAF. Dr. Mbeng was the co-author of the article: "The RINAF project: a computer networks interconnection of the African countries".

The Conference was also attended by Mr. M. Benhamadi from Algeria as a RINAF representative of a regional node.

- 4) First International Working Conference on Health Informatics in Africa "Helina '93", organized by the International Medical Informatics Association (IMIA), the Obafemi Awolowo University (OAU Computer Science Dept. and Teaching Hospitals Complex) and by the Kuopio University of Finland. The conference was held in Ile-Ife, Nigeria, on 19-23 April 1993 and the RINAF project was represented by Mr. A. Gebrehiwot, a telecommunication engineer from Ethiopia presently working at the CNUCE Institute for the same project; Mr. Gebrehiwot presented the article: "Technical platform adopted in the RINAF project to bring basic Internet services to 15 african countries".
- 5) "Meeting of high level experts in Informatics in Africa and RINAF" conceived within the Informafrica program, which has been held in Nairobi, Kenya, on 12-16 July 1993. Organised by the UNESCO Regional Office for Science and Technology (ROSTA) in Nairobi, this intellectual forum has reviewed informatics technology and its possibilities for Africa, as well as discussing the progress of the RINAF project and the means for extending its benefits. A document on the "RINAF goals, project organization and implementation status" has been submitted along with other papers.
- 6) " Workshop on Electronic Networks for West African Universities" organised by the Association of African Universities (AAU) and by the American Association for the Advancement of Science (AAAS) which took place in Accra, Ghana, on 15-17 December 1993. The project was represented by Mr. Neil Robinson, a technical expert of the RINAF regional node placed in Zambia (Computer Centre of the UNZA) who attended the Workshop presenting the article: "The RINAF project: goals and organization" written by the RINAF staff in Pisa.

RINAF staff activities

The main activities carried out by the RINAF staff working in Pisa exclusively for the implementation of the project have been the following:

Permanent training on telematics services organized within the RINAF project for African students and graduates residing in Pisa.

The training course has been activated in the frame of the RINAF project under suggestion of the project Technical Coordinator Stefano Trumpy and organized by Abraham Gebrehiwot and Louis B. Hell. The objectives of the course are to provide:

- Basic knowledge of computers
- Knowledge on the use of the Internet network services
- Introduction to the African networking

The course started on the 5th of February 1993. The course is held once a week alternating practice and theory at the CNUCE Institute in Pisa. The participants are about 20 and almost all of them are African students and graduates from Pisa's University, coming from different faculties varying from Medicine, Engineering to Information Science; most of them have shown great interest and have gained a good level of expertise. The participants have been permanently assisted by the course organizers. A wide documentation (Introduction to computers, Introduction to telematics, Computer networking and RINAF solutions, Electronic mail, FTP, Telnet, Gopher etc.) has been produced and distributed.

All participants have already gained the necessary knowledge to become autonomous users of the Internet network. 12 virtual machines have been activated by the CNUCE Institute on the VM/IBM machine and are used for practical exercises.

The outcome of the course has been satisfactory so far. At the beginning the students were encouraged to keep regular communications with other African correspondents from Mozambique, Senegal, Cameroun, Ethiopia, Kenya, Uganda, Egypt and others. Since communications among people belonging to the same country has resulted of very great interest, four African discussion lists have been activated at the CNUCE Institute and are presently maintained by the students. These lists are:

CAMNET

Camnet is a mailing list which has contributed to create a platform for the discussion on the network implementation in Cameroon along with other Cameroonian topics of interest. The

aim of the list is to help all Cameroonians in the world by giving them a powerful instrument for exchanging opinions among themselves. In this sense we can say that Camnet is a success; many Cameroonians in the world with an e-mail access to Internet have subscribed and others are asking every day to join in. Camnet has today more than 70 subscribers from all over the world. The list is maintained by Mr. Louis Hell from Cameroon, presently residing in Pisa.

NGR-MAIL

NGR-MAIL is a mailing list dealing with e-mail problems in Nigeria. The number of subscribers is at present 52 coming from all over the world. Given the great interest shown on e-mail connections with Nigeria, many research institutions are requesting to be connected to the RINAF regional node of Yaba College of Technology. Mrs. Iyabo Odusote, the RINAF node operator at the Yaba Tech., also take part to the above discussion. This list is maintained by Mr. Francis Eludini from Nigeria, presently residing in Pisa.

SENEGA-L

SENEGA-L is a mailing list dealing with Senegalese topics varying from cultural, social, economical, etc. The aim of this mailing list is to create a platform for all Senegalese subscribers to exchange opinions among themselves on the subjects quoted above. The number of subscribers is at present 36, most of them are Senegalese living abroad, but the number is bound to rise. Mr Fadel Diagne, RINAF Technical Responsible for Senegal, is also a member of the list. This is the first list on Internet that deals with Senegalese topics and its subscribers are showing great interest. The list is maintained by Mr. Alain G. Tendeng, information engineering student at Pisa University. He is following the permanent training on telematics services organized by the RINAF project at the CNUCE institute.

GUINEQ-L

GUINEQ-L is a mailing list dealing with topics related to Equatorial Guinea varying from cultural, social and economical aspects. The number of subscribers is 9. The list is maintained by Mr. Ovono Ruffino information engineering student at Pisa University, coming from Equatorial Guinea and presently residing in Pisa.

The RINAF discussion lists

Under suggestion of the RINAF Technical Coordinator Stefano Trumpy, two discussion lists called RINAF-L and RINAF-T have been activated respectively in 1992 and 1993 to distribute information on the project progress and to discuss technical aspects related to the implementation of the same. RINAF-L is a general information list which counts today 137 subscribers such as experts of African networking, project coordinators, African system operators, reserchers and students who participate to the discussion sharing their experience. RINAF-T is a technical discussion list of 26 subscribers (12 residing in Africa) whose members are directly involved in the project. Another list called RINAF-R which represents a tool for exchanging messages between the RINAF regional nodes and the RINAF staff in Pisa, has been recently activated and will certainly increase its importance during the second implementation phase of the project, when the number of countries involved will significantly grow. All the above lists are maintained by Mr. Abraham Gebrehiwot of the RINAF staff working in Pisa.

The RINAF Project Information Service (Gopher server)

Gopher is an Internet information service, started and managed by the University of Minnesota, which provides access to an enormous amount of information distributed on the network to its users. A Gopher server with the title "The RINAF Project Information Service" has been installed and is being constantly configured with updated information at the CNUCE Institute. This initiative has been put in place by Abraham Gebrehiwot of the RINAF staff under suggestion of the RINAF Technical Coordinator.

The objectives of the RINAF Project Information Service are the following:

- Giving online information on the RINAF project
- Giving online information on the TLC infrastructure and on the status of networking in various African countries.
- Gathering publications about African networking
- Improving the Internet information access on Africa

The above server is registered under the directory Africa. Before the activation of this gopher server the only information available on this same directory was related to South Africa and there was no other initiative of gopher server related to other African countries. From our experience we have realized how difficult it is to obtain information on African countries and for this reason, we are convinced that having online documentation on this

continent will be an efficient and useful instrument for all. Many Internet users have requested more information on the RINAF project after having accessed the gopher server.

Contacts with Country Coordinators and Technical Responsible

Useful interactions are constantly kept between the RINAF Organizing Secretariat and the above representatives for the management and planning of the nodes and for the accomplishment of the different proposals.

Purchase of TLC equipment, testing and shipping

In order to carry out the selection of the most appropriate equipment for the activation of the regional and national nodes, contacts have been kept with several Italian and foreign suppliers to obtain the best offers for the equipment requested by the country coordinators and technical responsible through the implementation plans (see annexes). A careful testing and configuration phase always follows the acquisition of the equipment, when this is purchased in Italy. The shipment is subsequently carried out and all the necessary documentation for customs clearance is also produced and sent to the final destinations.

Contacts with the UNESCO IIP, Steering Committee and African Committee

Contacts with UNESCO have been kept through the preparation and sending of progress reports on the activity carried out by the CNUCE within the project along with several other documents such as the technical specification of the equipment and services acquisition, financial reports on the status of expenditure related to the different implementation phases and others. Periodical reports and comments on the updated status of the project have also been sent to all members of the Steering Committee and African Committee in order to give them a clear and precise situation on the progressive implementation of the project.

Articles and papers

The assembling and editing of some articles on the status of the RINAF project to be presented during international conferences and workshops have been periodically carried out. The titles and authors of these papers are listed in the previous paragraph on the participation of RINAF representatives to events concerning data networks in the African continent.

Training courses

Training courses on networking for African system operators have been organized and kept by the RINAF staff in Pisa. The aim was to create a nucleus of technicians in charge with the management of the RINAF nodes. Two courses have been organized so far: the RINAF course for system operators held in Pisa on 26 Oct - 6 Nov 1992 (20 participants) and the following one held in Ile-Ife, Nigeria on 26-28 April 1993 (22 participants). The RINAF staff working in Pisa has taken care of:

- keeping contacts with the RINAF country coordinators for the selection of appropriate candidates
- sending letters of invitation along with the course schedule and general information to each participant
- keeping contacts with the course teachers chosen by the Technical Coordinator
- booking of all prepaid flight tickets (to be sent to the participants along with letters of invitation), of suitable accommodation and organization of transports
- registration of all participants to the international conferences held in conjunction with the courses

Activation of the regional nodes

Technical assistance and suggestions have been regularly given by the RINAF staff to the RINAF country coordinators and technical responsible in order to activate the nodes. However, in some cases, a delay in the project implementation has been caused, due to several reasons which are independent from the constant activity carried out by the RINAF staff working in Pisa.