JRC ISPRA

A 50 YEAR PICTORIAL HISTORY

JRC
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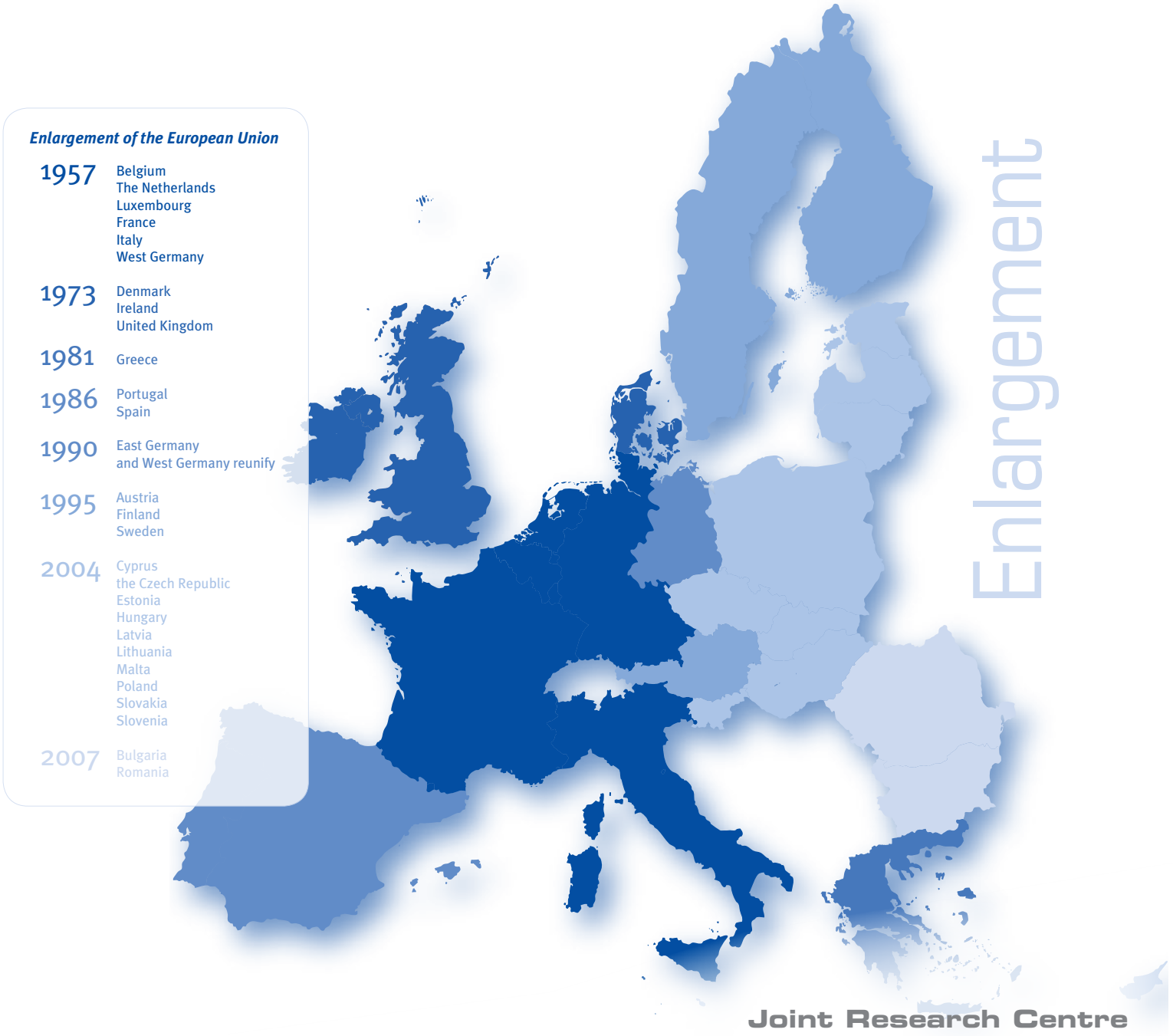

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OUR MISSION

The mission of the Joint Research Centre is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of European Union policies. As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Union. Close to the policy-making process, it serves the common interest of the Member States, while being independent of special interests, whether private or national.

JRC ISPRA

A 50 year pictorial history

European Commission
Joint Research Centre

JRC49907

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TABLE OF CONTENTS

A north-west facing view of the JRC' s Ispra site and the east shore of Lake Maggiore in Italy. Photo taken in the 1980' s.

Foreword

IN CELEBRATION OF THE 50TH ANNIVERSARY OF THE JRC ISPRA SITE

Since the beginning of the Joint Research Centre (JRC) there has been a wealth of publications describing the wide-ranging scope of research carried out at the Ispra site. However, none have illustrated how the JRC has transformed over the past five decades in such a “pittoresque” way as this brochure does.

This brochure takes you back to 1959 when the Italian nuclear authorities passed the site on to the JRC (signature and handing over on July 22, 1959, in Rome). It shows how the Ispra site has been evolving from then to the present day. Starting out as a nuclear research centre, the site became home to also non nuclear scientific disciplines, all of them with the aim of improving the well-being of the European citizen, covering research in areas of the environment and sustainability, natural and man-made hazards, health and consumer protection issues and many others.

I am sure that for many of you who have worked in Ispra the brochure will bring back fond memories. For others, it will show just how much the JRC Ispra site has changed over the last 50 years. Today, Ispra is the third largest site of the European Commission, well noted by the Institutions of the European Union and recognised in the world of science and technology.

I hope you will enjoy reading this brochure as much as I did.

Roland Schenkel
Director-General, JRC

Rural landscape
Delivery of the IBM 7090 Computer for Scientific Applications.

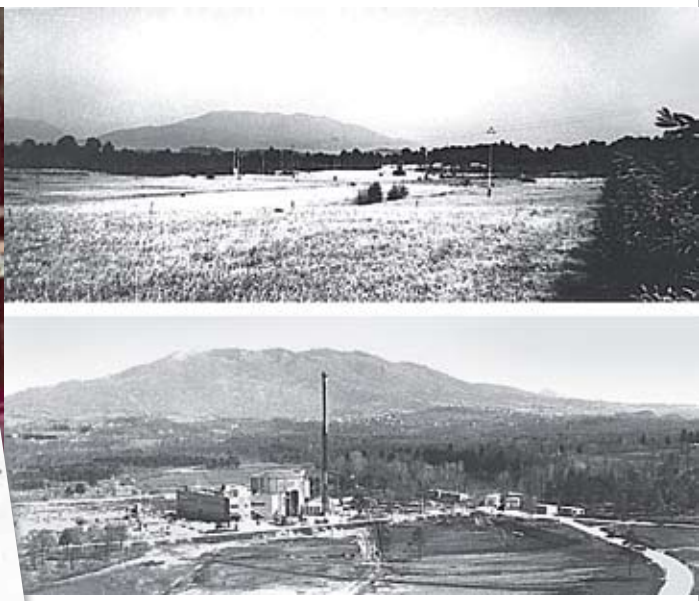
Development of the Ispra site

THE FIRST YEARS

The Italian Centre in Ispra originally belonged to the Comitato Nazionale per l'Energie Nucleare (CNEN) and was officially transferred to the Community on March 1, 1961. In the summer of 1960, a programme of building construction was embarked upon in order to satisfy the increased need for laboratory space, workshops, testing sheds and offices to extend the existing infrastructure. By 1962, many buildings were ready for use. In addition to various wooden buildings, priority was given to nine prefabricated metal buildings for office and laboratory space, the European Scientific Data Processing Centre, buildings for solids decontamination, metallurgy, health physics and technology sections together with a chemical laboratory and a central workshop. In addition, the existing laboratories were extended and the first stage of the construction of the European School in Varese was completed.

At the same time a network of roads and the necessary infrastructure for production and distribution of electricity and heat, water supplies and processing of waste and telecommunications were developed. Staff accommodation was a serious problem but CNEN and the Commission assisted to solve this.

Signature of the Treaties of Rome
On 25 March 1957, the signature of the Treaty on the European Economic Community (EEC) and the Treaty on the European Atomic Energy Community (Euratom) took place. Article 8 established a Joint Nuclear Research Centre to ensure research programmes and tasks assigned to it by the Commission and establish a uniform nuclear terminology and a standard system of measurements.



The JRC site in 1956 (top) and 1959 (bottom).

22 July 1959 in Rome - formal signature and ceremony of handing over the Ispra Centre CNEN (Centro dal Comitato Nazionale per l' Energia Nucleare) to the Community.

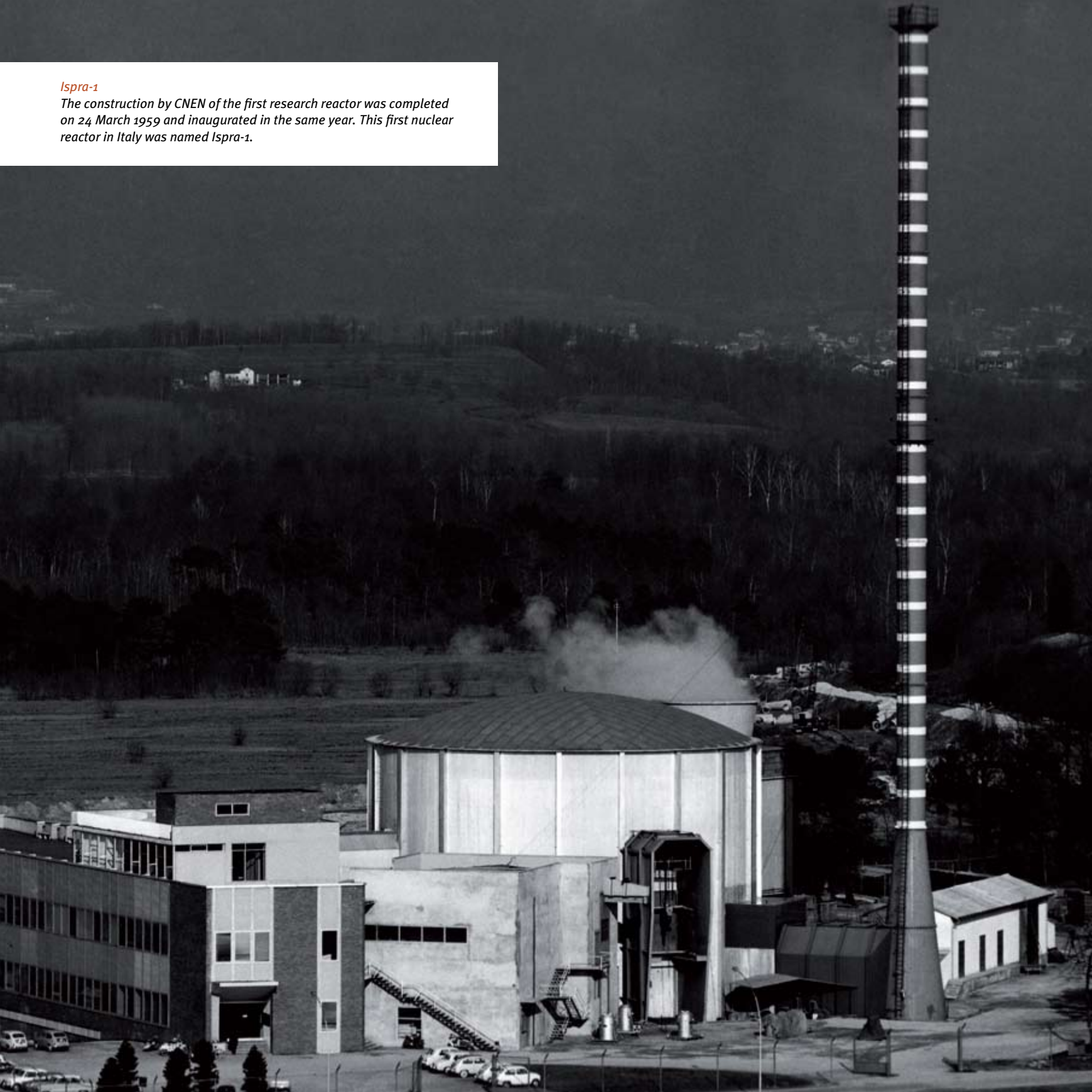
LA COMMISSIONE DELLA COMUNITÀ EUROPEA
DELL'ENERGIA ATOMICA

HA L'ONORE DI INVITARE _____

ALLA COLAZIONE CHE AVRÀ LUOGO IL 23 MARZO 1961 ALLE ORE 13.00 AL PALACE HOTEL DI VARESE, CHE SARÀ SEGUITA DA UNA VISITA AL CENTRO DI ISPRA E DALLA CERIMONIA DEL PASSAGGIO DEL CENTRO DAL COMITATO NAZIONALE PER L'ENERGIA NUCLEARE ALLA COMMISSIONE DELL'EURATOM.

Si prega di rispondere a
Ufficio Relazioni Pubbliche e Stampa
C.C.R. - Ispra
Casella Postale N. 1
ISPRA (Varese) - Tel. 78.131

Official ceremony in Varese of the handing over of the Ispra site from CNEN to the Community after ratification by the Italian parliament.



Ispra-1

The construction by CNEN of the first research reactor was completed on 24 March 1959 and inaugurated in the same year. This first nuclear reactor in Italy was named Ispra-1.

NUCLEAR FACILITIES

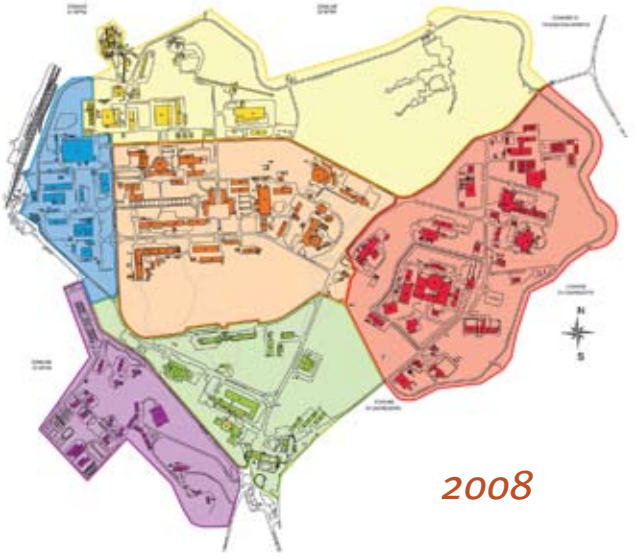
Ispra-1
1958 – The Ispra-1 control room, waiting for the reactor to go critical.

Ispra-1
Remote handling device for the change of fuel rods in the Ispra-1 reactor.

1958

1958-1995

2005



2008

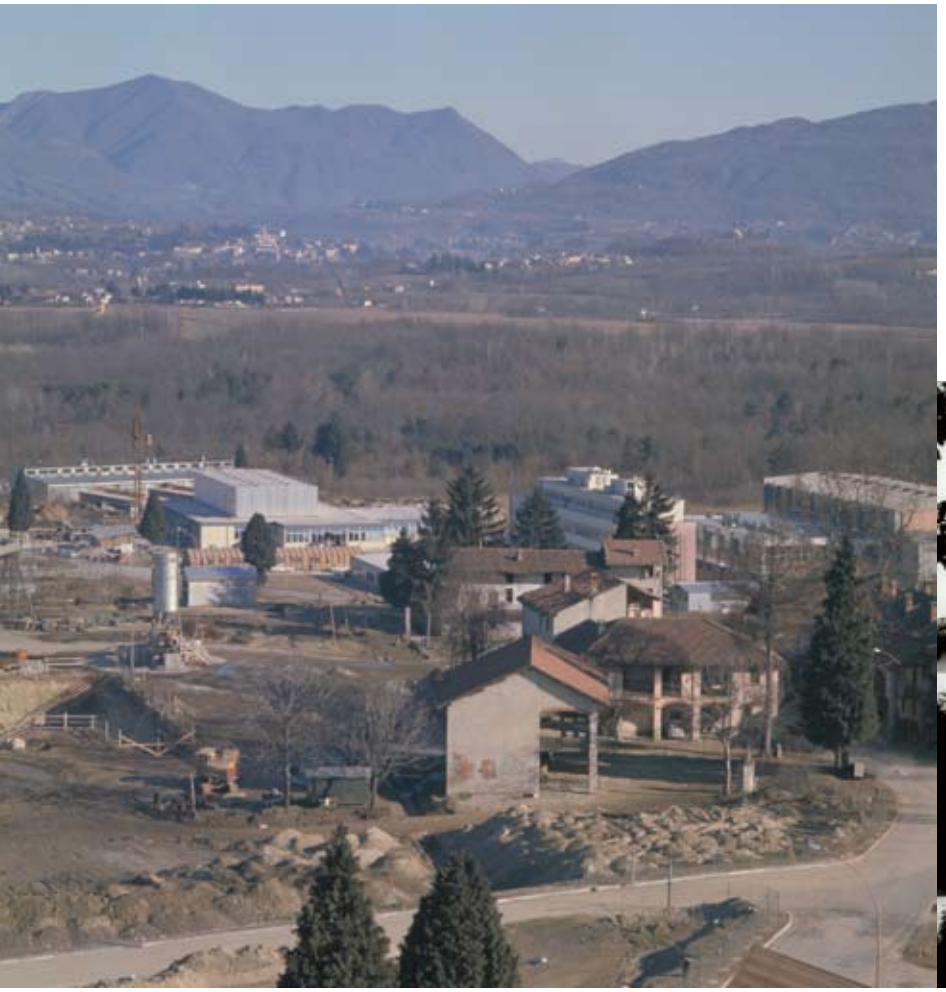
MAPS OF THE ISPRA SITE FROM 1958–2008

In 1958 the Ispra site only had a basic road structure. The facilities available at Ispra covered an area of 9500m². By March 1961 it was extended to 12500m². On 31 March 1961 the total EURATOM staff at Ispra amounted to 810 persons, including 250 former CNEN personnel.

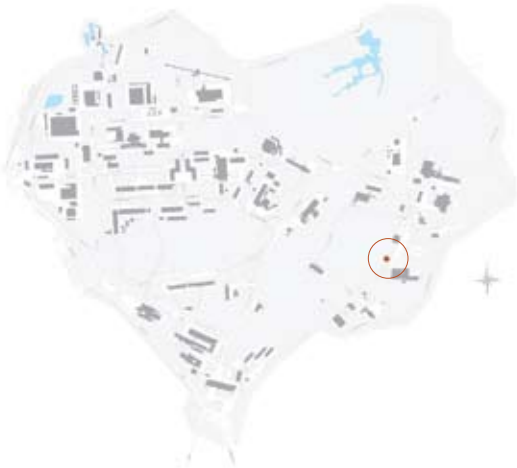
At the beginning of 1961 several European architectural studios started to draw up a draft design to improve the Centre. In October 1962, two firms submitted detailed designs. By 1962 the total laboratory and office space increased to 15500m². The peak occupancy was in 1968 with some 2300 staff including non-permanent staff, scientific visitors, students and research fellows.

Since 1973, non-nuclear research evolved rapidly, especially in topics related to safety and the environment. These activities required different types of buildings and infrastructural services with smaller laboratories and more offices. Most buildings and infrastructure installations were built over the period 1958-1975, at a time when environmental and energy saving considerations were not a prime concern.

However, in 1992 the results of a study led to a proposal to convert the JRC Ispra site into an environmentally-optimised model site – the “ECO Centre”.



The small agricultural community of Monteggia was part of Ispra, before the ESSOR reactor construction in 1959.



RELOCATION OF THE MADONNA OF MONTEGGIA

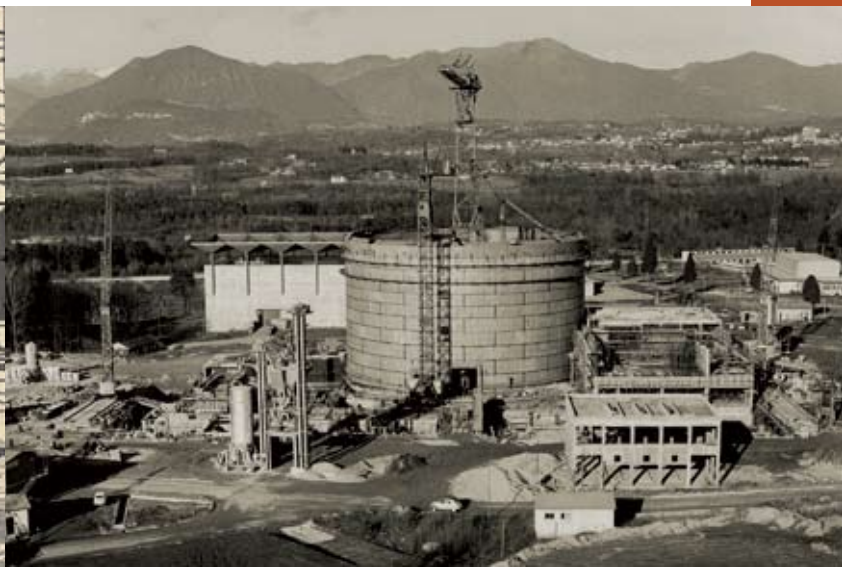
As the area of Monteggia was to be demolished, the statue of the Madonna was transported in a religious procession to a new location. The original Madonna is now in Barza and a copy of the Madonna was placed in front of the ESSOR reactor.

The Madonna of Monteggia.

View from old Monteggia
The old houses of Monteggia and the dome of ESSOR reactor in the background.

FROM ISPRA-1 TO ESSOR AND THE NUCLEAR MISSION

Experience Critique Orgel (ECO)
Group picture with the first director of EURATOM, Dr. Gerhard Ritter after the foundation ceremony.



Essai Orgel (ESSOR) construction phase
In 1962 the decision was taken to build ESSOR. The reactor is in a pressure vessel of 45m² at a height of 45m; 12m of which is underground. The buildings surrounding the reactor are hot laboratories, workshops and standard laboratories. The reactor was built by a European consortium, comprising Groupement Atomique Alsacienne Atlantique (GAAA, France), Interatom (Germany) and Montecatini (Italy).

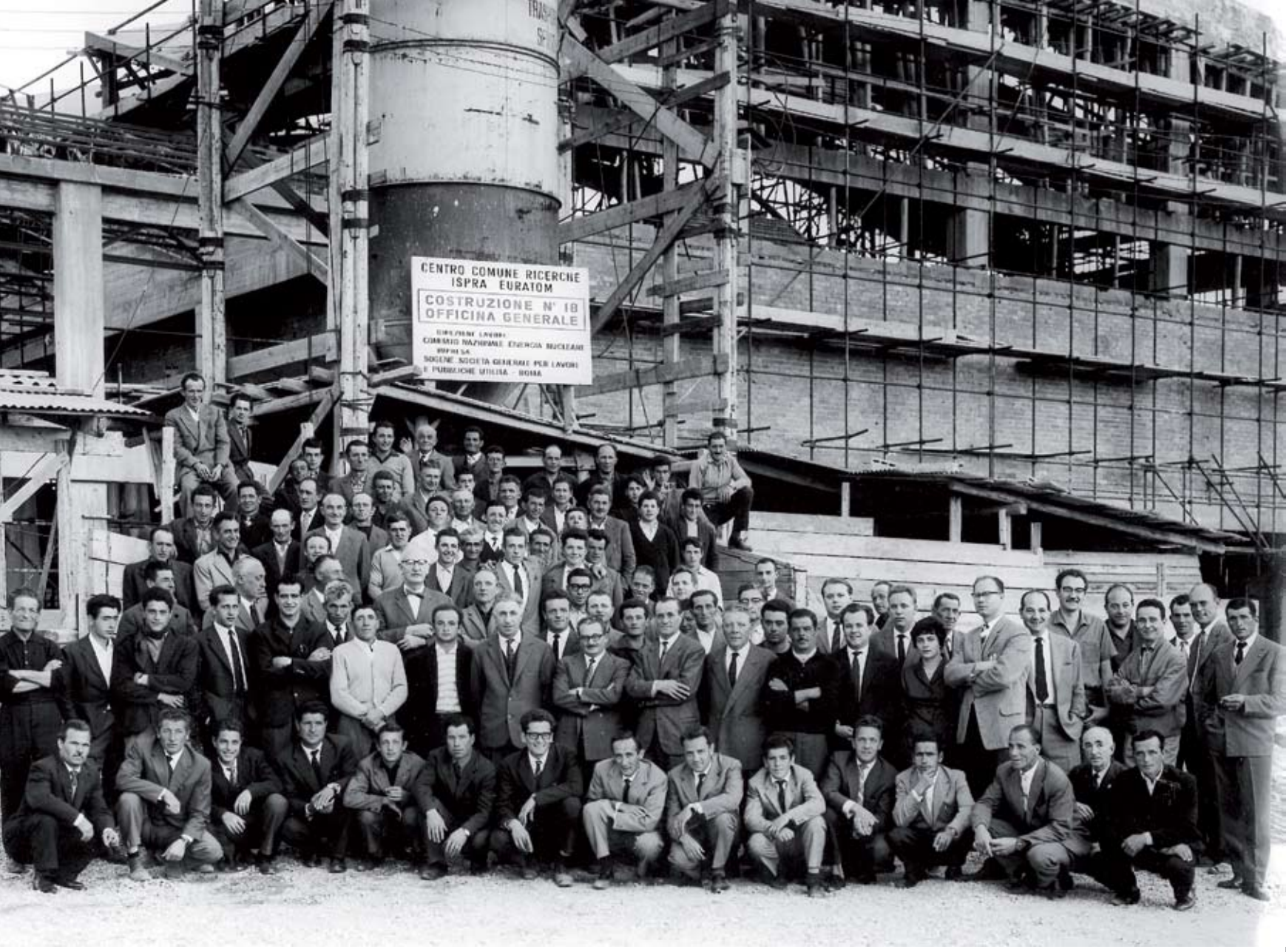
Building 51 – Radio Protection

This is the only building which is located outside the JRC premises. It was built at the end of the 1960's and hosted the control room to monitor radiation levels. Legally, the control room had to be at an appropriate distance from the reactors.

CETIS ❶

CETIS (Centre Européen de Traitement de l' information Scientifique) was the first European Centre for scientific information. It was built in 1964.

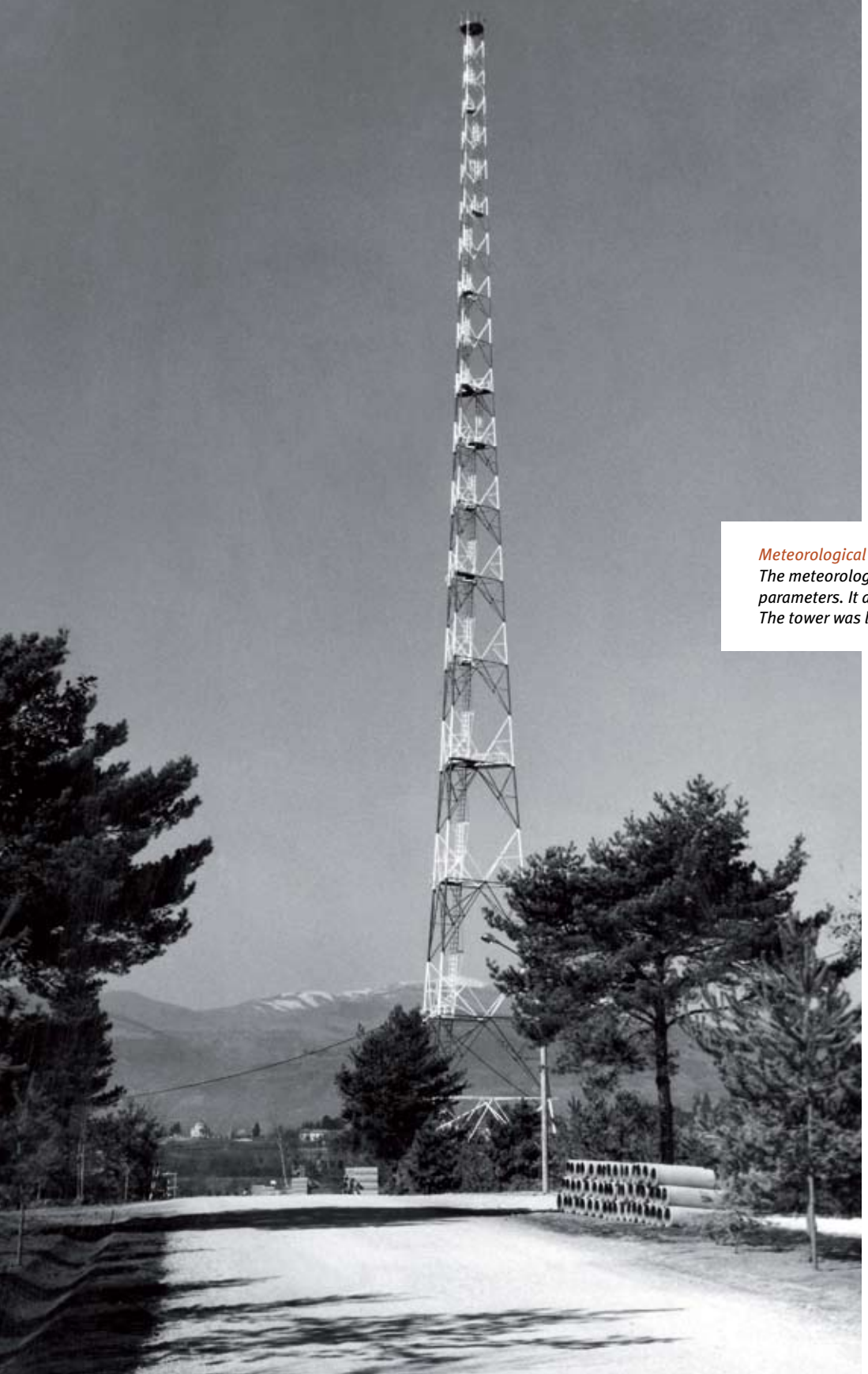
❷ *Technology Hall in the background, design offices and various laboratories in the foreground.*



Central Workshop
Personnel in front of the Central Workshop in the 1960's, during the construction phase.

Opening of the Central Workshop on 11 May, 1962.

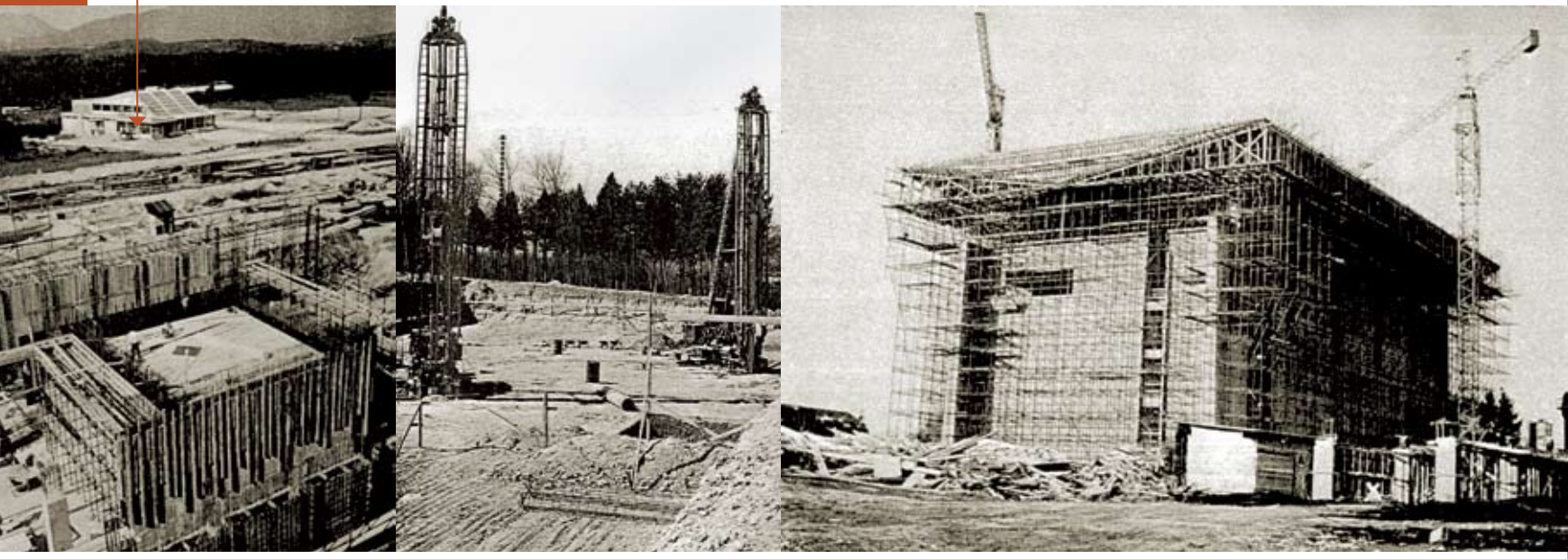
Construction of the Central Workshop, with wooden buildings in the foreground for the workmen. One can see that the housing density of Ispra was very low in 1964.



Meteorological Tower 1

The meteorological tower was constructed to monitor critical weather parameters. It also served as the main lightning conductor in the JRC. The tower was located opposite to the Mensa.

Entrance ❷
The main entrance/exit to the JRC in the early 1960' s and a multilingual roadsign.



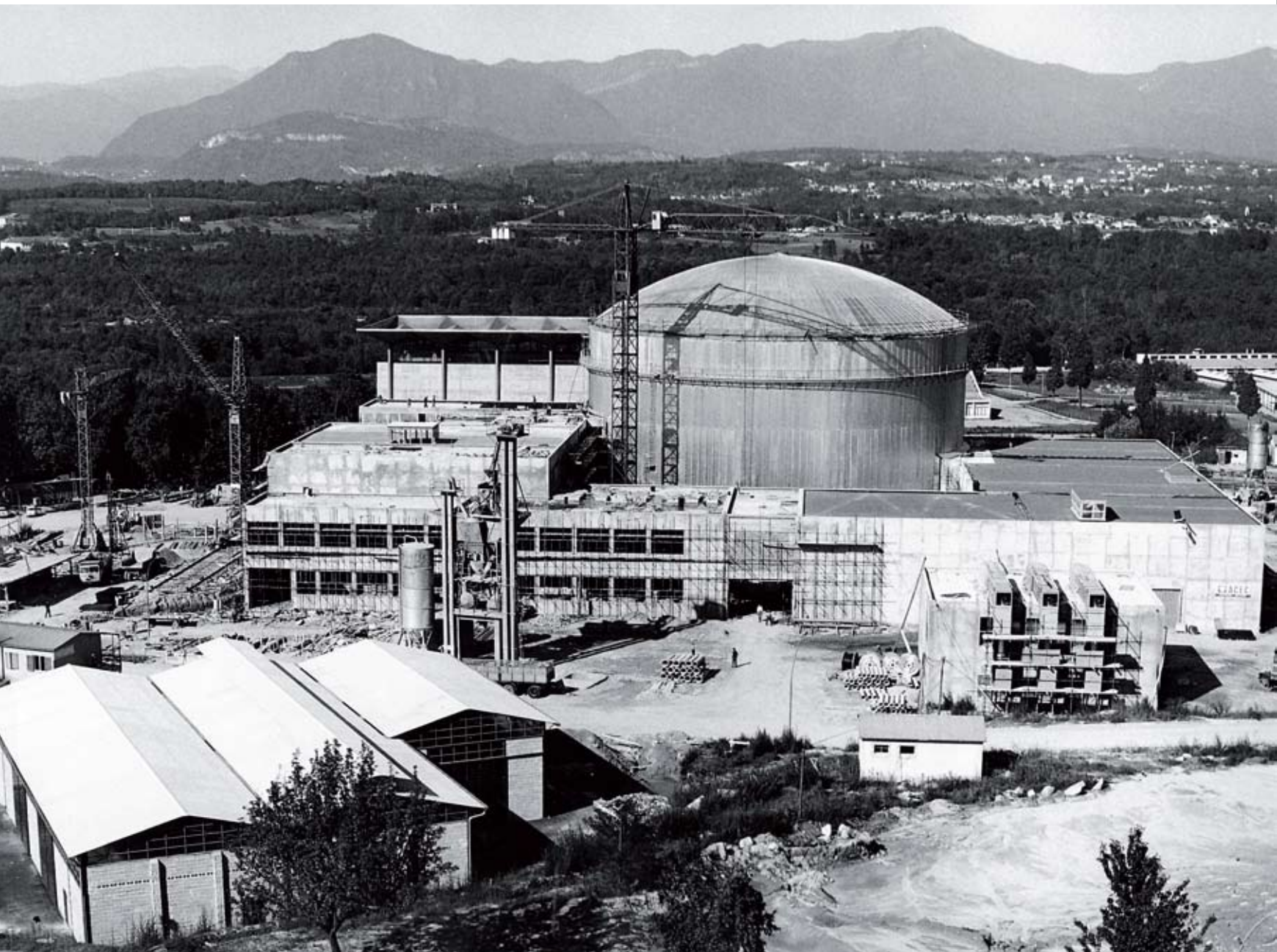
Construction of ECO (Orgel critical experiment)
After the ratification with the Italian government, scientific work in some departments started in spring 1961.
In 1963 further extensions of the research installations continued.

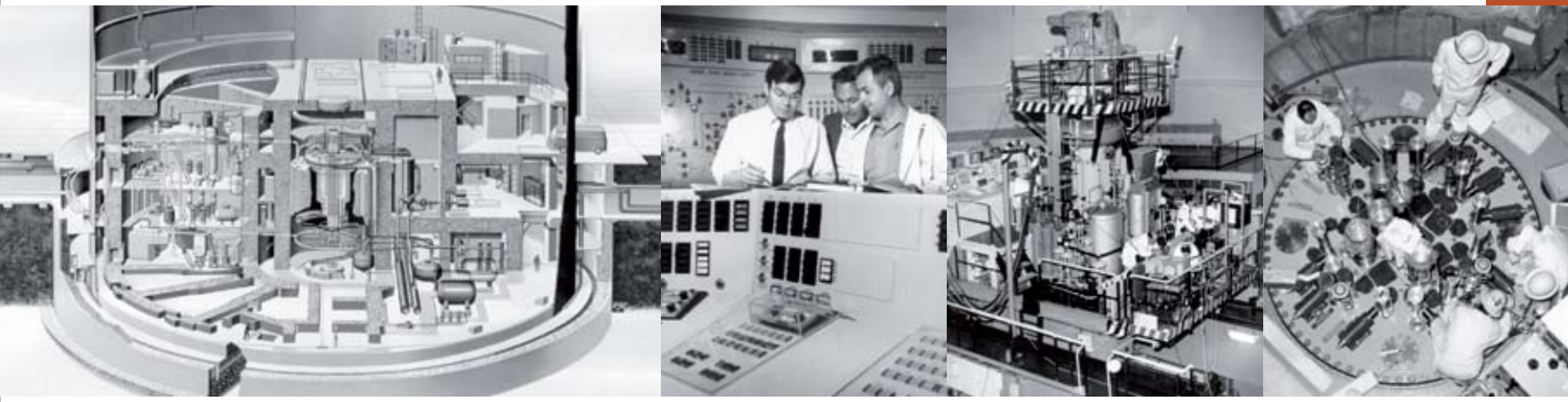
ECO

The ECO (Orgel critical experiment) building was used for the study of critical parameters of the ESSOR reactor. Construction was finished in 1964.

ESSOR

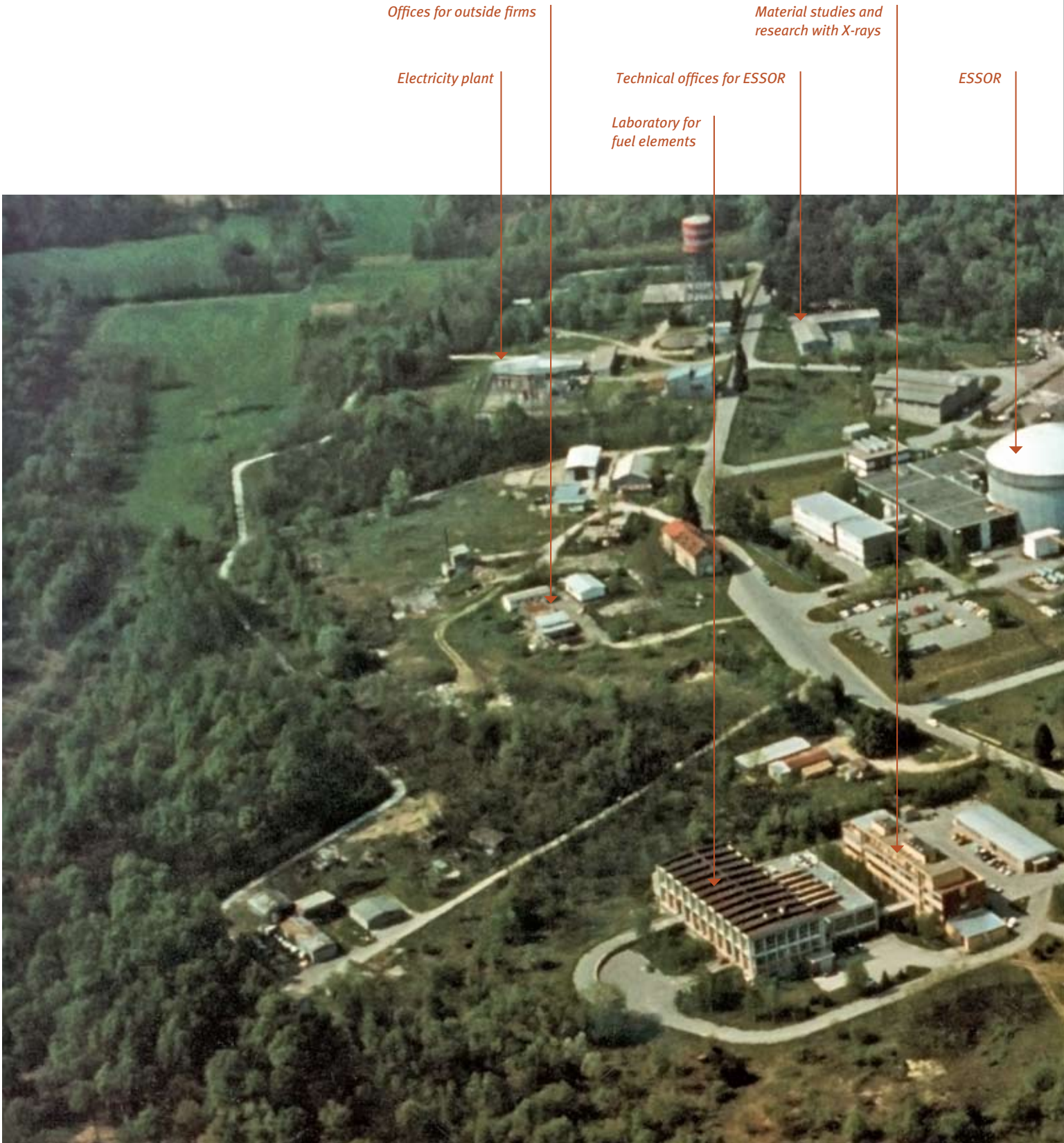
The ESSOR reactor in Ispra began operation in 1967, following several years of planning. ESSOR stands for "Essai ORGEL", ORGEL being an acronym for "Organique-Eau Lourde", since the reactor was based on a novel concept using organic liquid coolant and heavy water as moderator. After 16 years of research, the reactor was shut down in 1983.

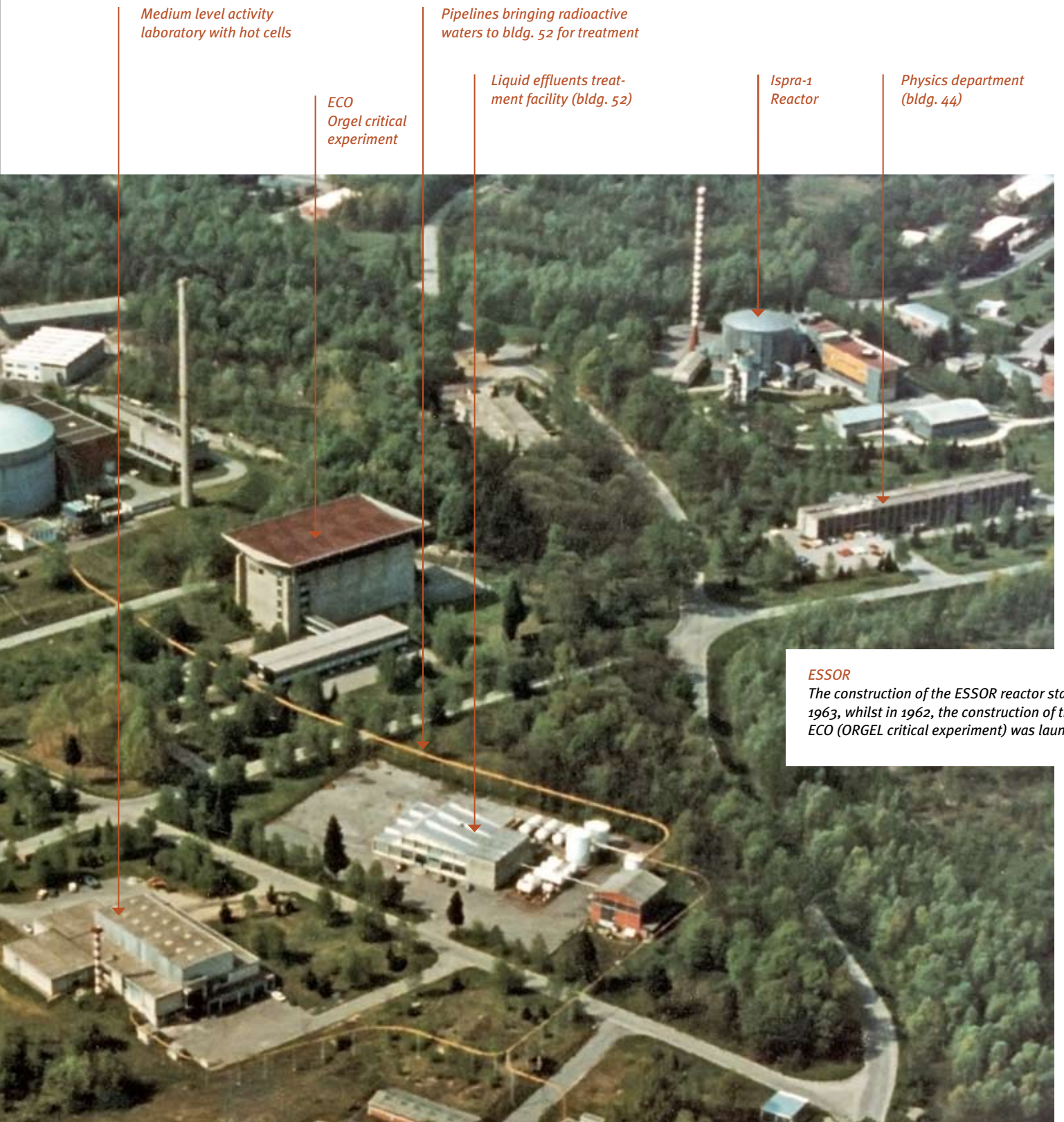




The ESSOR complex

At the beginning of the 1980's re-examination of the mandate and evaluation of the activities of the JRC began. Future activities were to continue to support the Commission's implementations of Community policies. However, in 1986 major Community R&D programmes were launched with a distinctly industrial orientation. This sparked the construction of large installations throughout the JRC.

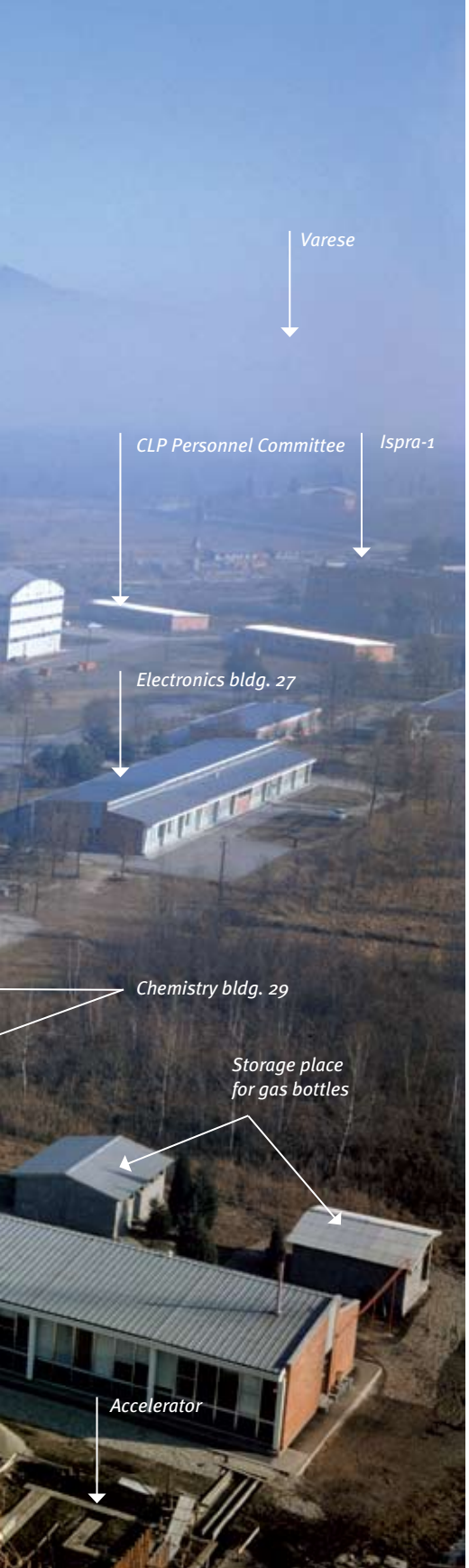

Offices for outside firms
Material studies and research with X-rays
Electricity plant
Technical offices for ESSOR
ESSOR
Laboratory for fuel elements



ESSOR

The construction of the ESSOR reactor started in 1963, whilst in 1962, the construction of the reactor ECO (ORGEL critical experiment) was launched.

Research zone
Aerial photo showing principal research installations.



APPLIED NUCLEAR RESEARCH

According to the programme of development for nuclear reactors, it was proposed to build a series of laboratories specialised in various fields for research closely connected to the Ispra-1 reactor. It was necessary to construct a laboratory for the study of the physics of the reactor, of nuclear and of solid state physics; a laboratory to examine the engineering problems of the reactor, a chemical laboratory, an electronics laboratory and one for the study of the servomechanism and controls, as well as a 'hot' chemistry laboratory which followed.

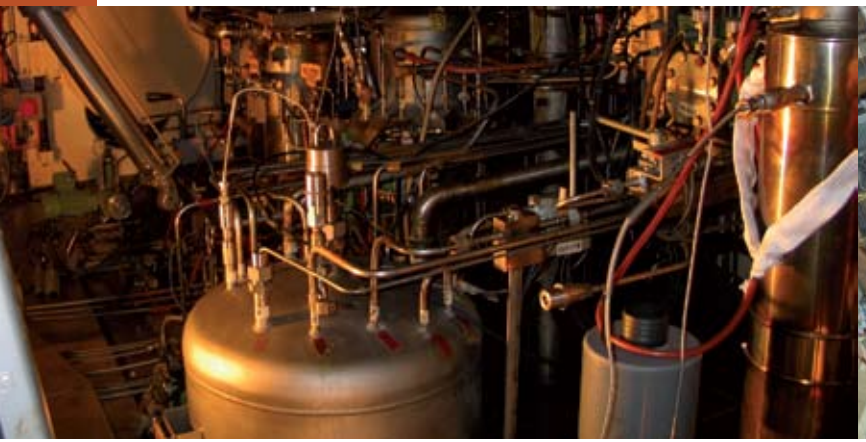
The European Laboratory for Structural Assessment (ELSA) ❶

The largest European laboratory for testing innovative design concepts at large scale was inaugurated in October 1992 and was part of the re-orientation of activities in the JRC. This is a unique technological tool at the disposal of the European construction industry at large. The reaction wall is used for testing large-scale models of buildings, bridges and cultural heritage structures.

NEW RESEARCH AREAS

ESTI ❷
The European Solar Test Installation (ESTI) began its activities in the measurement and testing of Photovoltaic Solar modules in the late 1970' s.

SOLAR HOUSE ❸
The Solar House was inaugurated in 1976. The south wall is covered with various self-orienting types of solar collectors and these were tested to measure performance and to estimate endurance, resistance to corrosion, rain, hail and snow.



PETRA

In the 1980' s, as a part of its Radioactive Waste Management and Fuel Cycle Research Programme, JRC Ispra installed the experimental facility of PETRA (Process Evaluation and Testing for Radwaste Management) in the hot cells of INE (Impianto Nucleare ESSOR). Petra was designed to operate at a pre-industrial fully active scale on high-burn-up fuel material with the goal of implementing various treatment and conditioning processes on the waste streams produced. The last nuclear test was performed in 1993.

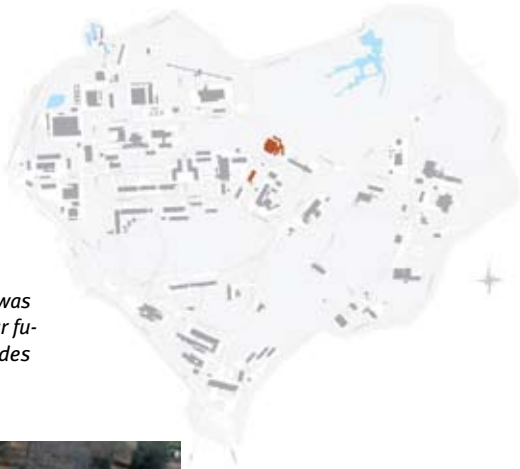
LOBI – Loop Off-Normal Behaviour Investigations

In the aftermath of the Three Mile Island accident in 1979, the LOBI project was launched. The project focused on assessing reactor safety analysis. In 1979, part of building 24, the former Technology Hall, was refurbished. The objective was to investigate the thermo-hydraulic behaviour of the reactor during a loss of coolant accidents. In 1984 it was extensively modified, it operated from April 1984 and was stopped in June 1991, after completion of the planned experimental programme.

REORIENTATION IN THE 1980'S

SUPERSARA
The SARA and SUPERSARA test rigs were designed and realised in 1982/83 in order to perform experiments on the behaviour of PWR (pressurized water reactor), BWR (boiling water reactor) and CIRENE (CISE-Centro Italiano Studi Esperienze REattore a NEbbia – fog-smog reactor) fuel clusters.

PERLA
PERLA is a laboratory for the assessment and performance evaluation of non-destructive assay (NDA) techniques applied in the safeguarding of nuclear materials.

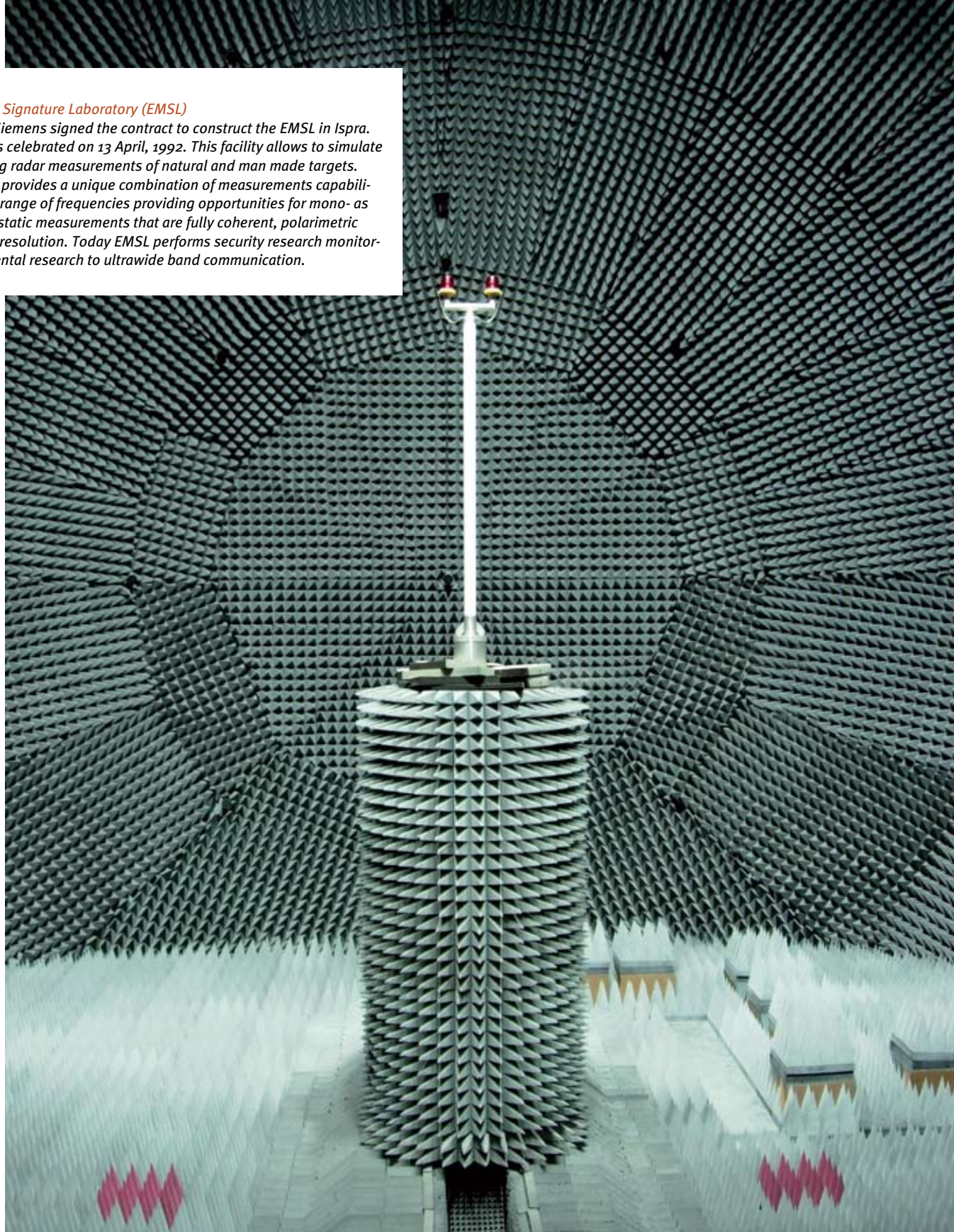


Cyclotron

Today the JRC' s Scanditronix MC40 Cyclotron is a versatile light ion accelerator with seven beamlines. It was commissioned in the early 1980' s, and used initially for radiation damage studies on materials for nuclear fusion reactors. Nowadays it is primarily devoted to health applications, with daily production of radionuclides for medical imaging, and a number of research projects in Nuclear Medicine and Nanotechnology.

European Microwave Signature Laboratory (EMSL)

In 1989 the JRC and Siemens signed the contract to construct the EMSL in Ispra. The inauguration was celebrated on 13 April, 1992. This facility allows to simulate air-and space imaging radar measurements of natural and man made targets. The EMSL laboratory provides a unique combination of measurements capabilities, covering a wide range of frequencies providing opportunities for mono- as well as bi- and multi static measurements that are fully coherent, polarimetric and at a high spatial resolution. Today EMSL performs security research monitoring – from environmental research to ultrawide band communication.



TACKLING ENVIRONMENTAL ISSUES – THE ECOCENTRE

At the beginning of the 1990's, the JRC started a fundamental transformation.

In 1994, a master plan was developed for progressive long-term remedial action, remodelling the site in an ecologically and esthetically sensitive, yet economically feasible, fashion. The site was to be divided into the following zones:
The High Density Zone, what is today referred to as "Science Zone" - with new laboratories, offices and a fairly compact urban building structure connecting buildings by pedestrian walkways. This was to become the core area for the future Eco Centre.
The Entrance Zone – with the Reception building, the Mensa, the Administration buildings and a new Visitors' Centre.
The Eastern Zone – with all the nuclear installations and some infrastructural facilities. It was planned to fence this area in compliance with nuclear safety rules and security provisions.
The Western Zone – with sufficient room for enlargement towards the north.
The road system would be removed and downgraded to cycle and pedestrian paths.

New building rules and projects were agreed and the following were completed:

- Retrofitting of various buildings to reduce heat/energy loss
- Construction of the co-generation plant
- Covering the south facing wall of ELSA (European Laboratory for Structural Assessment) with solar panels
- Construction of the ECVAM building (European Centre for the Validation of Alternative Methods)
- Construction of the ECB building (European Chemical Laboratory)
- Canteen roof fitting

High Density Zone
In front of the high density zone and the Gemelli buildings (in yellow), a lake has been planned. The lake should be crossed by a light bridge connecting the Entrance Zone with the Canteen and the Central place.

THE ECOCENTRE – NEW CONSTRUCTIONS AND LABORATORIES

New Mensa ❶
The south facade of the mensa was retrofitted with the intension to create a comfort zone using natural and mechanical ventilation. Control factors were air temperature, relative humidity and air speed. It was a first contribution to research in the field of bioclimatic design.

ELSA photovoltaic south facade ❷
In 1996 a new south facade of the ELSA building was refitted with amorphous silicon photovoltaic panels and was, at that time, the largest facade of its type in the world. After 11 years of operation all modules are still operating with a nominal peak power of 21 kW. By modern standards this is relatively low, but the system has produced 153 MWh over the years and the panel efficiency has now fully stabilized.

High Density Zone
Overview of the High Density Zone planned as a part of the Eco Centre Project.

THE HIGH DENSITY AREA

ECB
(European Chemicals Bureau)

ECVAM
(European Centre for the Validation of Alternative Methods)

IES / IPSC ❶

The twin buildings 26 A and 26 B, also known as Gemelli, host the Institute for Environment and Sustainability (left) and the Institute for the Protection and Security of the Citizen (right). These buildings are part of the EcoCentre project which started in 1996.

THE NEW ECOLOGICAL FOOTPRINT

Water Purification Plant ❷

The Water Purification Plant was built at the end of the 1970' s and serves the whole site; it also treats part of waste water from the Ispra municipality. The cleaned water is discharged into the Torrente Novellino that flows into the Lago Maggiore. In 1999 a further disinfection system, which uses UV-C rays, was installed.

Co-generation Plant ❸

In September 2004, the co-generation plant went into operation. Since then it has supplied nearly 100% of the site' s needs of electric, thermal and cooling energy. The efficiency gains resulting from the co-generation have allowed the JRC Ispra to save some 30% of primary energy (methane gas) and the same amount of greenhouse gases, as compared to conventional generation of energy. The picture shows the installation of one of the four Otto engines.

Main Entrance

In the late 1980's the entrance gate could no longer cope with the increased traffic and security requirements. Modernisation and enlargement were necessary. The main entrance was increased from 2 to 5 lanes and a car park was built outside the JRC for visitors. Today, on average 200 visitors enter and exit the JRC each day. The daily car traffic is around 1200 cars per day.

Entrance gate in 2007

On the occasion of the 50th anniversary of the Treaties of Rome which gave birth to the JRC, the Ispra entrance gate was transformed into the Brandenburg Gate for a period of 6 months, celebrating the reunification of Europe.

ISPRA TODAY

Administration (Bldg. 6) ❶

The Administration building hosts part of the JRC' s support services including the Headquarters of the Ispra Site Directorate, JRC Personnel, Accounting and Planning Departments as well as services of the Commission Paymaster' s Office (PMO).

Scientific Library ❷
Built in 1985, this building initially hosted the Professional School as part of the Central Workshop. Since the late 1990' s, it accommodates the Ispra site Library.

Maintenance ❸
The Site Maintenance & Operations Building and the Site Development Building in 2006.

Fire Brigade ❶

The Ispra site' s own fire brigade, since recently renamed into "Site Response and Support Team", does not only intervene in case of fire or road accidents, but is also responsible for fire prevention and environmental protection.

ENEA ❷

ENEA (Ente per le Nuove Technologie, l' Energia e l' Ambiente) started research in Ispra in 1956 under the CNRN (Comitato Nazionale per le Ricerche Nucleare). In 1988, ENEA constructed its own building on the Ispra site. The building is divided in 4 parts and hosts administration, meeting rooms, a technology hall and offices. The water collectors and solar panels are examples of bioclimatic architecture.

ESTI ❸
The European Solar Test Installation (ESTI) initially developed characterisation and measurement techniques to support the European Commission' s DGXII (now DG Research) activities on non-nuclear energy.

IHCP ❹
The Institute for Health and Consumer Protection (IHCP) provides scientific support for the development and implementation of EU policies related to health and consumer protection.

Foresteria

In 1960 the Italian government was to build a total of 1500 apartments for the personnel of JRC Ispra, to be completed by 1965. The so-called "Residenze" consisted of 38 apartments for personnel who needed to live close to work. Only 30 Foresterias for visitors and 18 Fontanone for families were built next to the Centre. Another 50 apartments were constructed by the CNEN in Cardana (village close to Ispra) as well as 50 apartments in Cocquio close to Besozzo. In Brebbia 30 more wooden houses were built.

Social Facilities and Infrastructure

FAMILY HOUSING AND SCHOOLING

A large research centre such as Ispra requires well developed social/family support services and facilities. At the outset, in the early 1960's, a library, medical service, workshop, central store, vehicle maintenance, some lodging, a canteen, chapel, museum and water supply were functional and available. The following decade saw a considerable expansion of services and facilities, some of which are illustrated under this section. Nowadays the JRC Ispra strives to continuously improve services and facilities in order to provide both a stimulating working environment, as well as a suitable social environment for its staff and their families.

Fontanone
Homes for families of short-term JRC staff.

European School
On 19 September 1960 the European School in Varese opened. The courses started in 2 buildings which were seconded by the Comune of Varese, with 9 teachers and 9 pupils. On 23 March 1961 the first stone of the new European School was laid and the teaching in the new building started on 8 January 1962. At the beginning of the school year 1964 the number of pupils had risen to 808 and 58 teachers. The European Baccalaureate is recognised as qualification for university entrance in all the Member States.

Tennis Club

The Club started in 1962 and the development was slow. The first tennis court was rented in a private garden of a family villa. Soon after that, the tennis court in Taino and the one in Luvinate joined the Club. With financial assistance for social activities from the Commission, the Club House and the tennis courts were built. Today the Club is certainly one of the best in the area, with 7 courts, 3 of which are covered.

Club House

The Club House was built in 1975 and modernised in the late 1990's. It is a private structure reserved for the JRC staff and their families, pensioners and members of the JRC sports and social clubs. The various conference and meeting rooms are used today for scientific meetings as well as cultural events.

Post

The first post office on the site.

Mensa ❶

The "vecchia mensa" or old canteen already existed when the Ispra site was handed over to the JRC. Initially the canteen managed to serve about 300 lunches, however, the mensa was also open for dinner.

ONSITE SUPPORT SERVICES

Medical Centre ❷
The Medical Centre was completed in 1965. The Medical Service is responsible for health and safety at the JRC Ispra site and comprises conventional medicine as well as nuclear medicine and safety. Occupational health includes monitoring and safeguarding the workers' health and their working environment.

Local Staff Representation ❸
The local staff committee and unions building, built in 1965. The local staff committee represents the interests of the staff and is elected every 3 years.

Science Zone

Planned "Science Zone" designed to concentrate scientific activities at the centre of the site, with easy access to conference facilities.

The Way Forward

The Ispra site is particularly concerned with the fragmentation of its scientific activities over many small, often outdated buildings, and located in different zones of the site. This reduces efficiency, prevents sharing of laboratories, hampers communication and exchange between and across research groups. To address these problems, JRC Ispra has adopted a comprehensive development plan which is aimed at concentrating the scientific activities at the centre of the site ("Science Zone").

The plan foresees in particular the construction of the following new facilities:

- Environmental research building
- Life Sciences research building
- Security-related research building
- Multipurpose meeting facility and canteen
- Kindergarten - Crèche

The crèche entered into operation in March 2009 whilst the buildings for environmental and life sciences research are in an advanced state of planning.

Map showing the dispersion of the Institutes over the site and the intended "Science Zone".

The Environmental Research Building construction is expected to start in 2009. The construction of a further building for life sciences is in the planning phase.

Site Development

Designs for the new research facilities to form the core of the new Ispra Science Zone. This picture shows the east-west facade and an atrium amidst the twin-winged buildings.

The new Auditorium

This provides the Ispra site with large-scale, modern conference facilities, seating up to 270 people and featuring state of the art audio-visual technology and interpreters' booths. Smaller meeting facilities are available adjacent to the central room. This facility was officially opened on 10 October, 2008.

FIRST PROJECTS FINISHED IN 2009

The new Kindergarten
Construction of the new Kindergarten (Crèche) near the Foresteria. From March 2009 on, this new structure replaced the previous facilities which were accomodated in several buildings. A total of 86 places for children aged 0-4 will be available, embedded in a modern, children-friendly environment.

Landscape and Nature

The JRC Ispra covers an area of about 166 hectares and has 36 km of roads and 6 km perimeter fencing. 109 hectares are tended green areas and about 27 ha are wooded areas. The JRC is divided into various green areas:

- Ornamental areas, which are small gardens with shrubs and bushes mainly around the buildings
- Landscape gardens, which are further away from buildings and cover bigger areas with climbers, trees, hedges and flowers
- Woods
- Grassland

In the woods and grassland, nature is left to flourish, representing a considerable environmental value. These relatively wild areas are a haven for flora and fauna with minimal disturbance by humans.

It is the policy of the JRC to preserve and protect such wilder areas.

Gardens
A colourful welcome at the main entrance.

Pheasant
Wild life can flourish throughout the Ispra site.

Walkways
Footpath crisscrossing the Ispra site to encourage walking to the Mensa.

Woods
Park surrounding the laboratories.

The wetland areas
The pond and the air pollution monitoring station on its shore.

Seasonal impressions of the Ispra site.

Ispra site

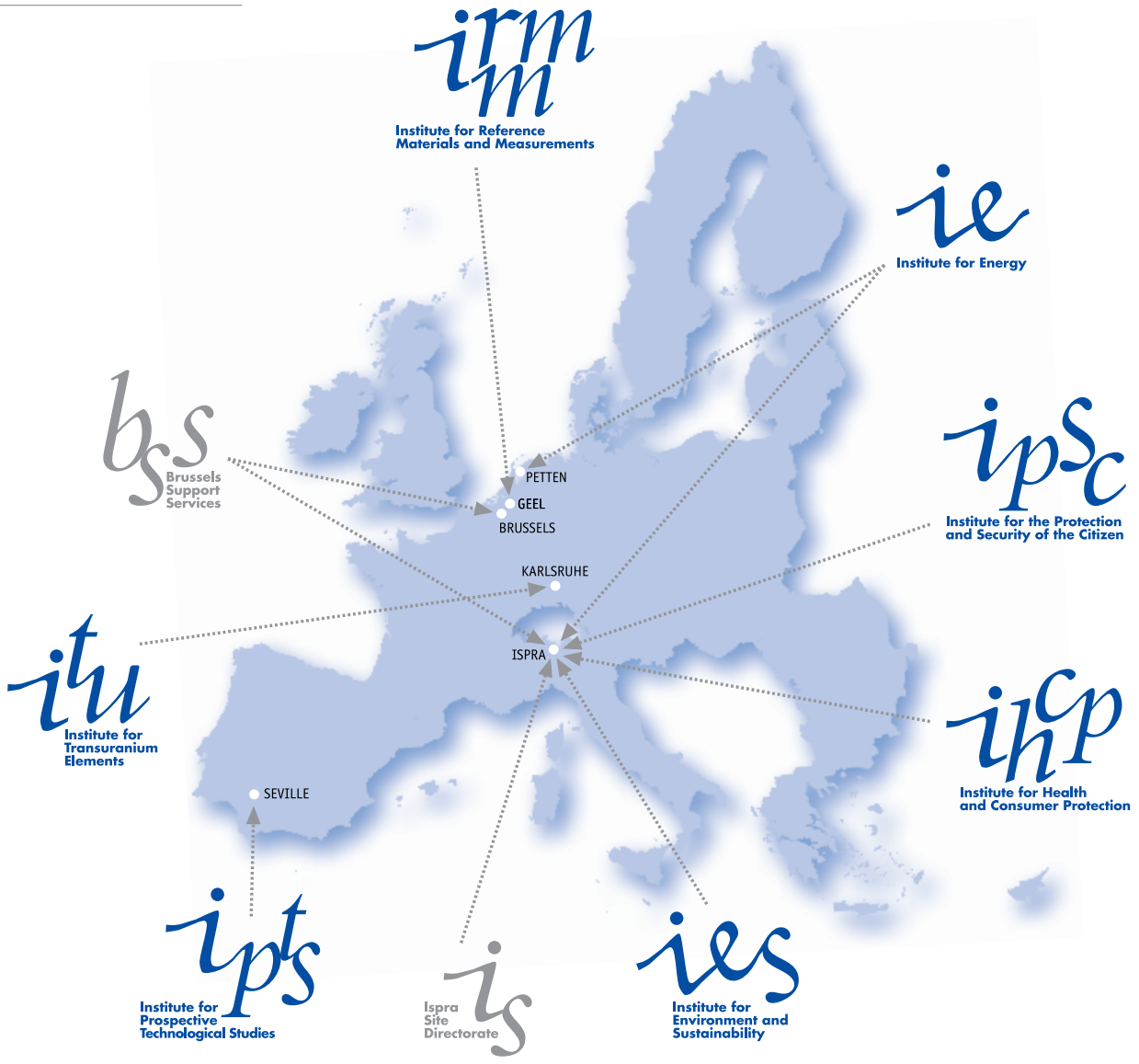
The site covers an area of 166 hectares, and has 36 kms of roads and 6 km of perimeter fencing. There are about 140 heated buildings with roughly 1850 staff plus external organisations and daily visitors. It hosts 3 scientific institutes and support services.

Epilogue

DAVID WILKINSON

After 50 years of development, Ispra is firmly established as one of Europe's leading research campuses. Nested in the beautiful setting of the Italian lakes, Ispra provides a fascinating, multicultural working environment for almost 2000 people from all over Europe and beyond. Supported by well-trained administrative staff, some of Europe's most brilliant scientists work here on the great challenges of humankind, always trying to find the best possible scientific solutions for the well-being of the citizen and the planet. Over the past years Ispra has become a real trademark for excellent science in support to European policies. Watching its development from the historical roots in the Euratom Treaty to its present shape, I am firmly convinced that Ispra has a bright future ahead.

David R. Wilkinson
Ispra Site Director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