



EUROPEAN COMMISSION
DIRECTORATE-GENERAL
JOINT RESEARCH CENTRE
Internal Audit Unit

FINAL REPORT 04/11/2014

AUDIT OF

<JRC PORTFOLIO OF BUILDINGS >

IA - 13 – 01(218)

	<i>Date</i>
Engagement Planning Memorandum adopted:	03/07/2013
First Draft issued:	19/06/2014

<i>Phases of the audit process</i>	<i>Name / Function</i>	<i>Signature/ Reference</i>	<i>Date</i>
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EXECUTIVE SUMMARY	3
1. INTRODUCTION.....	5
1.1. PURPOSE AND JUSTIFICATION OF THE ENGAGEMENT	5
1.2. DESCRIPTION OF THE ACTIVITY	6
1.2.1. Preliminary analyses	6
1.2.2. The Strategic Plan – April 2013 and recent constructions	6
1.3. KEY FIGURES	7
2. OBJECTIVES AND SCOPE	8
3. AUDIT METHODOLOGY AND PLANNING	9
3.1. AUDIT METHODOLOGY	9
3.2. INDIVIDUALS INTERVIEWED	9
4. FINDINGS	11
4.1. GOVERNANCE ASPECTS.....	11
4.1.1 Documents concerning the JRC Infrastructure Strategy	11
4.1.2 Addition of TFID to the existing governance structure	12
4.1.2.1 Evolution of the organizational structures.....	13
4.1.2.2 Recent reorganization of the governance process – the TFID.....	13
4.1.3 Procedure for handling of Infrastructure Projects.....	16
4.1.4 Conclusions regarding governance.....	17
4.2. INDIVIDUAL FINDINGS - GEEL SITE	19
4.2.1 Site Master Plan	19
4.2.2 Office building project.....	19
4.3. INDIVIDUAL FINDINGS – PETTEN SITE	22
4.4. INDIVIDUAL FINDINGS FOR KARLSRUHE SITE.....	23
4.4.1 Site Master Plan	23
4.4.2 NCO Office building project.....	26
4.4.2.1 Cost escalation in the design phase	26
4.4.2.2 Cost escalation in the construction contract	26
4.4.2.3 Numerous addenda to the work contract	26
4.4.2.4 Overview of the project costs.....	27
4.4.2.5 Overview of the project parameters.....	28
4.4.2.6 Purchase of paintings for the NCO building.....	31
4.5. INDIVIDUAL FINDINGS – ISPRA SITE	34
4.5.1 Management of the 'buildings 100 and 101' project.....	34
4.5.1.1 Multiple contracts for the design and work supervision.....	34
4.5.2 Site level management of the projects.....	44
4.6. FINDINGS COMMON TO THE SAMPLED PROJECTS	45
4.6.1 Analysis of current premises – energy consumption.....	45
4.6.2 Preparation of individual infrastructure file –general design	48
4.6.3 Comparison of performance indicators.....	49
Table 12: performance indicators comparison	49
Table 13: Office Furniture Costs comparison	50
Table 14: Consultancy Costs comparison	50
4.6.4 Lack of a local/corporate procedure and appropriate back-up to ensure completeness of the project	50
4.6.5 Risks related to sensitive posts.....	50
5. CONCLUSION	51
6. ANNEXES	53
6.1 ANNEX 1: TABLE OF RECOMMENDATIONS	53

EXECUTIVE SUMMARY

Objectives and Scope	<p>Unlike most directorates general of the Commission, the JRC has to manage itself its buildings, scientific infrastructures and nuclear facilities. The JRC manages a portfolio of 176 (occupied) buildings, many of them highly specific, with a total surface area of some 302.000 m², plus 40km of internal roads.</p> <p>According to the JRC Strategic Infrastructure Development Plan 2012-2020, most of these buildings are becoming old.</p> <p>Moreover, the JRC has committed itself to the environmental targets of Europe 2020 Strategy, which promotes a more resource efficient, greener and more competitive economy.</p> <p>The main objective of this audit is evaluation of the efficiency of the management of JRC's buildings and its alignment with the long-term scientific priorities.</p> <p>The audit focused on the activities and transactions carried out along the implementation of the working contract sampled: 2009-2013.</p>
Conclusion and major Observations	<p>The audit has confirmed all risks identified at the start of the exercise. Nonetheless, in the course of the audit, new risks have emerged.</p> <p>The JRC strategic plan, that has not been updated or approved, wouldn't be recognized or efficiently implemented.</p> <p>Other major findings are:</p> <ul style="list-style-type: none"> • The lack of a senior corporate scientific role to supervise the continuous alignment of any scientific infrastructure projects with the JRC's scientific strategic goals. • The lack of a good life-cycle cost assessment of the projects; the plurality of contracts, combined with their inefficient management, has not allowed an adequate control of costs.
Recommendations	<p>This audit report includes 6 recommendations, which are classified as follows:</p> <ul style="list-style-type: none"> • No critical recommendations; • 4 (four) very important recommendations; • 2 (two) important recommendations; • No desirable recommendations.

Audit Opinion	<p><u>Unsatisfactory</u></p> <p>Based on the results of our audit, as described in the objectives and scope of the audit engagement, we believe that the internal control and governance process in place does not provide reasonable assurance regarding the achievement of the business objectives set up for the activities audited.</p> <p>Having said this, we consider that the JRC could significantly improve the development process of any new building, as well as their alignment with the long-term scientific priorities, if the recommendations summed-up below are adopted.</p> <p>Very important recommendations addressed at senior management level:</p> <p>The JRC Strategic Development Plan 2012-2020 and the Short Term Development Plan have to be formally up-dated and approved by the JRC's Director General.</p> <p>The JRC Strategic Infrastructure Development Plan 2012-2020 constitutes the guiding document for the implementation of the JRC's infrastructure policy. In order to be recognized and efficiently implemented it needs formal approval from the senior management.</p> <p>The JRC's Director General should mandate a senior corporate scientific role to overview the continuous alignment of any scientific infrastructure projects with the JRC's scientific strategic goals.</p> <p>The governance structure in place for the scientific infrastructure investments does not include a scientific oversight role at the corporate level. Accordingly, the alignment of the infrastructure proposals across the organization to the scientific future priorities of the JRC is not guaranteed.</p> <p><i>The preceding recommendation would be classified critical, but as there were steps taken by the Director General in order to reinforce supervision before further infrastructure projects are initiated, it was considered as "very important". In lack of durable measures, the associated risk has a potential to become critical again.</i></p> <p>The Director General, after having listened to the Directoire, will approve any contract or order of technical services, passing an established threshold, which has the specific goal to develop JRC-owned infrastructures.</p> <p>It is the responsibility of the Authorizing Officers by Subdelegation to provide due and timely justification on the building projects proposal and secure the hierarchical support before engaging any financial resources into the project.</p> <p>When assessing any new project for infrastructure and buildings, the Site Management Coordinating Committee must consider, at the planning stage, the need to keep the corresponding project accounting under sufficient control all over the development of the project, taking in consideration the constraints imposed by the JRC accounting systems. The developing of a valid tool for the cost-accountancy of the project should be considered.</p> <p>The plurality of contracts, combined with their inefficient management, covering the 'two-building' project in Ispra and with the lack of an efficient tool of cost accounting, has not allowed an adequate traceability of costs during the audit.</p>
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1. INTRODUCTION

1.1. Purpose and Justification of the Engagement

Unlike most directorates general of the Commission, the JRC has to manage itself its buildings, scientific infrastructures and nuclear facilities. The JRC manages a portfolio of 176 (occupied) buildings, many of them highly specific, with a total surface area of some 302.000 m², plus 40 km of internal roads¹. The basic infrastructure was set up in the early 1960s when the JRC received some 247 ha of land under the form of long lease², by the hosting countries of the sites established in Geel (Belgium), Karlsruhe (Germany), Ispra (Italy) and Petten (The Netherlands)³.

According to the JRC Strategic Infrastructure Development Plan 2012-2020, a significant share of these buildings are becoming old, since they date back to the time when the JRC sites were set up. A significant number have not undergone any substantial upgrading ever since; some were originally planned to host nuclear activities. As a consequence, most of them are outdated for the needs of current scientific and administrative activities, being expensive to refurbish heat and maintain. Besides being old, many buildings are of relatively small size, being located all over the sites, notably in Ispra, which has a direct impact on the efficiency of work.

Constant up-grading of buildings and infrastructure is also needed, in line with the evolving national regulations and to meet the site operating licences issued by the national authorities of the hosting countries.

Moreover, the JRC has committed itself to the environmental targets of Europe 2020 Strategy, promoting more resource efficiency. Compliance with Strategy 2020 will likely influence the development of our strategic policies regarding site development and building management.

The main potential risks identified during the preliminary survey, in relation to the management of the JRC buildings are the following:

- Inefficient use of the current premises.
- Absence of a formally adopted long-term building policy (coordinating document), enabling the JRC to meet its long-term strategic needs.
- Insufficiently integrated appraisal (cost, performance, etc.) of different options for improving the conditions of the current premises.
- Evaluation and approval of building project proposals lacking appropriate scientific involvement.
- Poor or unplanned implementation of the building-policy and incoherence between its different aspects (e.g. due to piecemeal approaches).
- Insufficient supervision of the (technical) project execution and of the contract execution.
- Lack of subsequent monitoring performance of the new projects (buildings).

¹ Source: JRC Strategic Infrastructure Development Plan 2012-2020, draft as of 22/06/2011

² i.e. for a period of 99 years

³ For the sites of Sevilla and Brussels the buildings are rent

1.2. Description of the Activity

1.2.1. Preliminary analyses

JRC's corporate initiatives in the area of infrastructure dates back to 2005⁴ when, following the requirement of the FP6 ex-post evaluation panel, the JRC set the first working group on infrastructure. This exercise has opened a series of analyses, conducted by several dedicated working groups.

- The 2005 exercise has produced an analysis for the Ispra site⁵, and the 'Priorities for JRC Infrastructure Development 2007-2010'.
- In 2009 the JRC Corporate Strategy – Synthesis report of the Expert Group on Infrastructures⁶ for 10 years (2010-2020) was made available.
- In June 2011 the 'JRC Strategic Infrastructure Development Plan 2012-2020' was released in draft⁷ and has not been up-dated so far.
- In the autumn of 2011, the Board of Governors acknowledged and welcomed the initiatives of the JRC as presented in the draft Master Plan of the JRC Strategic Infrastructure for a period of 10 years (until 2020).

1.2.2. The Strategic Plan – April 2013 and recent constructions

On the base of these plans and of the actual situation, a working document on the JRC building policy, as contribution to the "Commission building policy", was sent by the Director General to DG BUDG in April 2013⁸. The Strategic Plan, representing the aggregation of the inputs coming from each JRC Site Development Plan, has been submitted by the Director General to DG BUDG to support the approval of Horizon 2020, the Framework Programme for Research and Innovation.

Besides being a basis for the budgetary decisions for the next 7 years, the Strategic Plan and its previous variants have been used as guiding documents for the investments already carried-out in the different JRC's sites. Starting from 2013, a Short-Term planning document accompanies the long-term development plan in order to bring more focus on the projects which are already on the pipeline. From the interviews with the B.4 Unit representatives, we learned that the Short-Term planning will be in-depth analysed at corporate level and priorities should be set up (amongst the projects proposed) due to the budgetary constraints. A formal decision should be taken towards what projects will be financed.

According to the Long-Term Strategic Plan, the JRC is following the Commission's general policy⁹ on buildings, and aiming to concentrate scientific staff and their experimental facilities in a few, highly flexible structures. This approach intends to bring

⁴ And even earlier

⁵ Strategic Plan for the development of the Ispra Site, Version 7 of 05/10/2005;

⁶ Final version V1.0 of 14/12/2009

⁷ The corporate approach has been repeated in 2010 with a 'Working Group on JRC Strategic-Infrastructures 2012-2020'. This exercise built on the experience and analyses previously undertaken in the area and prepared an integrated Infrastructure Plan, which was submitted to the JRC's Director General. Further on, the Director General asked in March 2011 all sites' Directors to critically analyse the findings reported by the Working Group and present their investments proposals in a setting with all the other Directors being present. The result was the Strategic Plan.

⁸ "working document on the JRC building policy", sent on 02/04/2013.

⁹ COM (2007) 501 from 05/09/2007 Communication from the Commission on Policy for the accommodation of Commission Services in Brussels and Luxembourg

economies of scale through pooling of scientific activities and the related facilities and equipment.

Three sites have recently (2013-2014) completed major investments started in 2009-2010: in Ispra, two new "twin" buildings combining offices and scientific facilities; in Geel, and Karlsruhe, respectively, new offices buildings. All these projects are currently concluded and operational.

1.3 Key Figures

The amounts allocated to the strategic investments over 2009-2014 show an ascending trend, growing almost 6-fold over 6 years (Table 1).

Table 1 – Yearly Allocated Budget (€) for the Strategic Investments

Site/ Year	2009	2010	2011	2012	2013	2014
Ispra	€ 8,517,400	€ 2,570,000	€ 10,670,000	€ 21,429,579	€ 15,255,722	€ 20,289,613
Geel	€ 200,000	€ -	€ 1,975,000	€ 7,100,000	€ 5,893,141	€ 3,637,335
Karlsruhe	€ 1,600,000	€ 6,000,000	€ 9,000,000	€ 9,788,561	€ 18,900,000	€ 12,330,000
Petten	€ -	€ -	€ 3,110,000	€ 1,500,000	€ 1,900,000	€ 3,750,000
Sevilla	€ -	€ -	€ -	€ -	€ 512,857	€ 17,158,000
Total	€ 10,317,400	€ 8,570,000	€ 24,755,000	€ 39,818,140	€ 42,461,720	€ 57,164,948

Source: JRC approved budget for the years of 2009-2014.

In order to provide a comparison, we report hereby the specific Credits allocated to Directorates based out of Brussels for the same period 2009-2014, both nuclear (Table 2A) and non nuclear (Table 2B)

Table 2A - Allocation of Nuclear Specific Credits per year

Directorate	2009	2010	2011	2012	2013	2014
PSR	€ -	€ -	€ 80,000	€ 80,000	€ 40,000	
IRMM	€ 1,360,000	€ 2,300,000	€ 1,741,000	€ 2,809,000	€ 1,902,000	€ 2,400,000
ITU	€ 3,800,000	€ 4,150,000	€ 5,790,000	€ 5,954,900	€ 6,064,000	€ 6,217,000
IET	€ 1,800,000	€ 1,900,000	€ 1,933,000	€ 2,255,000	€ 2,244,000	€ 2,288,000
IPSC	€ 1,000,000	€ 800,000	€ -	€ -	€ -	€ -
IES	€ 240,000	€ 200,000	€ -	€ -	€ -	€ -
IHCP	€ -	€ -	€ -	€ -	€ -	€ -
IPTS	€ -	€ -	€ -	€ -	€ -	€ -
Total	€ 8,200,000	€ 9,350,000	€ 9,544,000	€ 11,098,900	€ 10,250,000	€ 10,905,000

Table 2B – Allocation of Non-Nuclear Specific Credits per year

Directorate	2009	2010	2011	2012	2013	2014
PSR	€ 900,000	€ 1,104,000	€ 1,940,000	€ 2,250,424	€ 2,405,000	€ 2,808,905
IRMM	€ 3,568,000	€ 4,208,000	€ 4,144,000	€ 4,634,000	€ 4,885,000	€ 5,200,000
ITU	€ -	€ -	€ -	€ -	€ -	€ -
IET	€ 3,332,000	€ 4,044,000	€ 4,682,000	€ 5,154,000	€ 5,213,000	€ 4,979,500
IPSC	€ 4,622,000	€ 4,435,000	€ 3,892,500	€ 3,916,000	€ 4,118,000	€ 4,233,500
IES	€ 6,981,000	€ 6,864,000	€ 6,827,000	€ 7,122,640	€ 7,605,000	€ 8,100,000
IHCP	€ 6,390,000	€ 5,400,000	€ 5,220,000	€ 5,220,000	€ 5,400,000	€ 5,590,095
IPTS	€ 4,207,000	€ 4,558,000	€ 4,520,500	€ 4,830,000	€ 5,141,000	€ 5,461,000
Total	€ 30,000,000	€ 30,613,000	€ 31,226,000	€ 33,127,064	€ 34,767,000	€ 36,373,000

2. OBJECTIVES AND SCOPE

The main objective of this audit is evaluation of the efficiency of the management of JRC's buildings and its alignment with the long-term scientific priorities.

To this end, the audit has:

A) Assessed the practices and procedures applied in the process of management of buildings at the JRC, focusing on:

- The existence and implementation of 'planning & prioritisation' methodologies both at the site level and JRC wide.
- The related organisational practices (i.e. procedures used by the Sites, existence of formalised harmonised approaches, coordination, sharing of good practices, etc.).

B) Verified the operational implementation of a sample of recent work contracts, with special attention being given to:

- Controls applied for managing different phases of the contract (i.e. award of contract, supervision and monitoring).
- Performance measurement methodologies, project reporting and work acceptance (what is reported by the contractor vs. what is verified by the JRC).
- Change orders, cost accounting, invoicing, and completion terms.
- Development and use of measurements for the improved performance of the new/refurbished buildings.

The audit is included in the 2013 IAU annual work plan and focuses on three of the sites where the JRC actually owns buildings: Ispra, Geel and Karlsruhe. The Units involved were selected according to the tasks assigned to them in relation to buildings and infrastructure and are presented under 3.2. Individuals interviewed.

The audit focused on the activities and transactions carried out along the implementation of the working contract sampled: 2009-2013.

The audit preparation and execution extends from June 2013 to January 2014. The corresponding fieldwork was carried out in Ispra, Geel and Karlsruhe and videoconferences were organised with the sites of Petten and Sevilla.

The IA work programme allocated 120 working days to this audit. The audit was performed by Anca-Maria Szigeti and Marco Tipaldi.

3. AUDIT METHODOLOGY AND PLANNING

3.1 Audit Methodology

The audit was conducted according to the following steps:

- A) Examination of relevant documents and preliminary interviews.
- B) Definition of the audit sample (selection of building projects for detailed analysis).
- C) Interviews and information exchange with representatives of the Scientific and horizontal Directorates:
 - Regarding the corporate and site level management of the infrastructure strategy and projects.
 - For the analysis of the sampled projects (work contracts).
- D) Analysis of information gathered and preparation of the audit report.

The assignment was conducted with the close collaboration of *Unit B.04 Budget, Accounting and Competitive Activities*, as well as of the operational teams of the Scientific Directorates and Ispra Site Management, as listed below.

3.2 Individuals interviewed

<i>Institute</i>	<i>Unit</i>	<i>Position</i>	<i>Name</i>
JRC.A Scientific Policy and Stakeholder Relations (Brussels)	A.8 Nuclear Safety and Security Coordination	Head of Unit (acting), Policy Officer	Said Abousahl
JRC.B Resources	B.4 Budget, Accounting and Competitive activities	Head of Unit - Budget, Accounting and Competitive activities	Jacques Van Oost
		Budget Officer	Isidoro Macias Sanchez
JRC.C, Ispra Site Management (Ispra)	JRC C	Director	Dan Chirondojan
		Assistant to the Director - Policy, analysis and advice	Raffaele Schipani
	JRC C.5 Site Planning and Development	Head of Unit Team Leader - Architect, responsible for the Works Supervision Sector	François Augendre Roberto Babich
Institute for Environment and Sustainability (Ispra)	JRC H	Policy Officer - Head of Sector - Infrastructure and Logistic Support - Health and Safety Officer	An Lievens
Institute for Health and Consumer Protection (Ispra)	JRC I	Logistic Support Co-ordinator - IHCP infrastructural services	Alberto Fusari
JRC.B Resources (Ispra)	B.5 Finance and Procurement	Team Leader - Head of Sector	Juan García Rubí
		Finance and Contracts Manager	Carlo Bellora
JRC.D, Institute for Reference Materials and Measurements (Geel)	JRC D1 Site management	Head of Unit - Infrastructure & Site Management	Marc Wellens

<i>Institute</i>	<i>Unit</i>	<i>Position</i>	<i>Name</i>
JRC.D, Institute for Reference Materials and Measurements (Geel)	JRC.D.1 Site management	Scientific / Technical Support Officer - Technical Supervisor, Building	Johan Meino de Jong
JRC.B Resources (Geel)	JRC.B.8, Resource Management Geel	Accounting Officer	Dirk Soenen
JRC.B Resources (Karlsruhe)	JRC.B.9, Resource Management Karlsruhe	Head of Unit Policy Officer - Head of Sector - Budget, Procurement and Finances	Jacqueline Ribeiro Alfred Jimenez Segarra
JRC.E, Institute for Transuranium Elements (Karlsruhe)	JRC.E.7, Nuclear Safeguards and Forensics	Head of Unit ¹⁰	Klaus Lützenkirchen
JRC.E, Institute for Transuranium Elements (Karlsruhe)	JRC.E.1, Site Management and Nuclear Safety	Scientific / Technical Support Officer - Team Leader for External Sites & Warehouse Management	Markus Gammelin
JRC.F, Institute for Energy and Transport (Petten)	JRC.F.1, Site Management	Head of Unit - Site Management	Juha-Pekka Hirvonen
JRC.F, Institute for Energy and Transport (Petten)	JRC.F.1, Site Management	Team Leader - Sector head Infrastructure	Franz Hukelmann
JRC.B. Resource (Seville)	JRC.B.11, Resource Management Seville	Head of Unit - Resource Management Seville	Vincenzo Cardarelli
JRC.A	JRC.A.Policy Support Coordination		David Wilkinson¹¹

¹⁰ Interviewed as acting HoU of E1.

¹¹ Interviewed as former Director of Ispra Site Directorate.

4. FINDINGS

4.1 Governance aspects

4.1.1 Documents concerning the JRC Infrastructure Strategy

As shown under section 2.2. 'Description of activity', two documents were identified as JRC-wide infrastructure policy documents:

- (1) in 2009, the 'JRC Corporate Strategy – Synthesis report of the Expert Group on Infrastructures' and
- (2) the 2011 'JRC Strategic Infrastructure Development Plan 2012-2020' (called hereinafter the Strategic Plan).

Although both documents have been recognised by the JRC Director Generals in official communications¹², none of them has been formally approved. One of the reasons may be the fact that this process was gradually taking shape, as the JRC has not dealt with such an exercise before, which does not belong to its core business. Concerning the latest version of the Strategic Plan, it is also understandable, that the JRC's senior management could not commit to its implementation prior to the approval of the Horizon 2020, since the budgetary support was not secured yet. Nevertheless, at the end of 2013, after the Common Strategic Framework for Research and Innovation (CSFRI) has been adopted, the JRC Strategic Plan still dates back to June 2011. It's not up-dated and approved by the JRC's Director General.

Beside the Strategic Plan, a third document is

- (3) the JRC Short-Term Development Plan (STDP), submitted¹³ to the Director General on the 24/06/2013; a new updated version was provided in spring 2014.

which doesn't take into account the Strategic Plan.

It includes up-dated information about the projects which:

- already have started,
- are planned to start in the coming 2 years,
- are in preparation phase in view of getting the licences from the national/local authorities.

These three categories, in the version sent in June 2013, amount to 38 projects, with a total cost of 413 Mio€.

The updated revision (spring 2014) contains infrastructure development projects for a horizon of 10 years. This shows an overlap between the short-term and long-term planning.

¹² On the 29th November 2010, the former JRC Director General sent an official note to all scientific Directors (thematic areas leaders at that time), asking them to prepare a 'costed proposal for their Thematic Areas for the development of research facilities'. The 2009 Synthesis report was attached to the note to be used as background information. The 2011 Strategic Plan was sent by the former Director General to DG BUDG in view of supporting Horizon 2020 approval.

¹³ Ref. Ares(2013)2474418 - 24/06/2013, Note for the attention of Mr. Dominique Ristori, The JRC Director General, Subject: JRC Short-Term Development Plan

Observation: The JRC Strategic Infrastructure Development Plan 2012-2020 constitutes the guiding document for the implementation of the JRC's infrastructure policy. In order to be recognized and efficiently implemented it needs formal approval from the senior management.

R.001.VI The JRC Strategic Development Plan 2012-2020 and the Short Term Development Plan have to be formally up-dated and approved by the JRC's Director General.

If the JRC senior management deems not feasible to commit to the long-term plan implementation due to its duration and budgetary implications, the short term plan should be formally endorsed and constitute the authority in the field. The Strategic Plan should be regularly up-dated and used as a guiding document for feeding the short term plan. Both must be aligned, updated and formally approved

Classification: Very Important

Type: Efficiency and Effectiveness

Proposed due date: 3M from the date of delivery of the final report

ICS: 8-Processes and Procedures, 9-Management Supervision;

4.1.2 *Addition of TFID to the existing governance structure*

One of the reasons leading to this situation is explained by the fact that the infrastructure activity did not have a corporate process owner. The working groups were only temporary, ceasing to exist as soon as they fulfilled their missions. The governance structure ensuring regular monitoring of the investment and infrastructure projects were the two corporate networks mentioned in section 4.1¹⁴, to which has been added the TFID.

The process owner of the infrastructure activity is still not well defined, due to limitations in the mandate of the TFID; nevertheless the SMCC remains the formal owner of the strategic documents mentioned in section 4.1.1.

According to its mandate, one of its tasks is to update the long-term strategy and to submit it for the Director's General approval.

During the audit interviews the chairman of the SMCC affirmed that one of the network's objectives for 2013 was to up-date the JRC Strategic Infrastructure Development Plan 2012-2020, Therefore the auditors will not issue a recommendation in this regard.

The SMCC is formed by heads of the site management units (Resource management Unit in Sevilla), the Head of Unit B.4 (Budget, Accounting and Competitive Activities) and the Head of Unit B.1 (Organisation Development and Internal Communication). It includes only technical and financial expertise. In its capacity of advisory body to the Director General, it provides a framework for the transparency and enhances harmonized communications (i.e. of information related to the infrastructure projects) between the sites and senior management.

¹⁴ The first one set up in 2007, the 'JRC Infrastructure Projects Steering Committee 'to monitor progress in project implementation'; It is not known when ceased to exist, however, it did not exist anymore in the first half of 2011, according to the IA-10-08 Review of Corporate Networks.

4.1.2.1 Evolution of the organizational structures

The organisational structures involved in the development and implementation of such projects evolved as follows:

- In 2007, the 'JRC Infrastructure Projects Steering Committee'¹⁵ was set up as a corporate network 'to monitor progress in project implementation'.
- In autumn 2012 the Director General has established¹⁶ the 'JRC Site Management Coordinating Committee' (SMCC), another corporate network¹⁷ aimed to develop the JRC wide long and short-term infrastructure planning, to plan implementation and reporting, as well as to create harmonised standards and best practices for site management.
- At the local level there is a process owner for the activity. The design of the site strategic plans, as well as projects' implementation is coordinated by the site management unit of each JRC site¹⁸ (excepting Sevilla and Brussels). In Ispra, Units C5 'Site Planning and Management' and C.4 'Maintenance and Utilities', placed under the ISM Directorate, deal with the entire site.

4.1.2.2 Recent reorganization of the governance process – the TFID

In June 2014, the Director General took the initiative for reorganizing the governance process for JRC infrastructure development. It includes **the establishment of the Task Force for Infrastructure Development (TFID)**.

According to its mandate,

"The Task Force for Infrastructure Development (TFID) has the role to support the Director General in the decision making process and in the implementation of the decisions taken, in order to ensure a coherent and transparent approach regarding matters of infrastructure development.

TFID will remain accountable to JRC Director General and will report or refer for validation periodically to the Directoire"

The Task Force should provide support to medium and major ID projects and it will be accountable to JRC Director General. It will report periodically to the Directoire. In this function, TFID will also provide a platform for technical analysis of specific infrastructure projects and will ensure the exchange of good practices throughout JRC.

Members of the TFID will be all the Directors of Scientific Directorates, plus the Director of Resources (Dir. B); it will be chaired by the Director of the Ispra Site Management Directorate (ISM). Its composition of the TFID can be extended on an *ad-hoc* basis if so agreed by the members, with other participants if more technical expertise is needed.

The TFID is established for a limited duration of six years, till the end of 2020. This time limit corresponds to the current multi-annual financial framework.

¹⁵ Quotation from the JRC Corporate Strategy – Synthesis Report, chapter 2.1.1 Current situations across the sites.

¹⁶ Note of the DG from 15/10/2012, subject: JRC Management Coordination Committee

¹⁷ Which replaces the previous one, about which no data is available

¹⁸ Unit D1- Site Management in Geel, E1- Site Management and Nuclear Safety in Karlsruhe, F1- Site Management in Petten

The IAU welcomes this initiative, **launched when the contradictory phase of this audit was still ongoing**, as it has anticipated some recommendations addressed with this audit report.

Since the TFID appears to substitute the former SMCC (and in some cases, to expand its functions), it could be assigned ownership of the audit recommendations originally addressed to the SMCC. **The IAU, considering that TFID is still a temporary task force and that the situation is under development, has decided to keep the SMCC as owner of the audit recommendations.**

To recapitulate, the entire governance & management structure actually consists of:

- The Sites' development units –mostly technical functions– which ensure the definition of needs and the implementation of projects (strictly at the site level).
- The SMCC (mostly technical and financial) functioning as a corporate body, deemed to deliver an informed opinion on the matter to the Director General, by the means of the Strategic Infrastructure Development Plan, the Short-Term Development Plan, plus reporting tools.
- The Director General approving the Strategic Infrastructure Development Plan and the individual projects.

In the audit team's view the governance structure lacks the overview of a scientific corporate function, which should ensure that the needs defined by the JRC's sites are coherent with the JRC's scientific strategic goals, while watching that resources are used in the most efficient way. So far, the definition of the scientific facilities' needs has been entirely left at the site level.

The present report has shown (see sections concerning findings in the sites) that the lack of such a supervisory function has sometimes led to modifications along the implementation of the construction projects caused by insufficient alignment of definition of scientific facilities needs with the scientific priorities. This resulted in higher costs and delay in the execution of the project.

Besides the immediate risks just mentioned, the JRC faces the risk of owning infrastructure facilities becoming not fit for purpose over a medium time horizon.

As the conclusions of the audit were taking shape, the audit team has ascertained that the Director General is fully aware of the risks related to the present way of tackling infrastructural projects and that he intends¹⁹ to intensify substantially the supervision process, and to ensure close direct control of the Directorate over any additional request to start a new infrastructure project. This information is essential for the assessment of the context, and for the ensuing assessment of possible critical risks.

In this sense, the decision taken by the JRC DG to establish a Task Force for Infrastructure Development (TFID) addresses such a risk.

However this Task Force is not a permanent body and accordingly can't guarantee a continuous function.

¹⁹ Cfr., *inter alia*, minutes of the Directoire of 31-1-2014.

Observation: The governance structure in place for the scientific infrastructure investments does not include a scientific oversight role at the corporate level. Accordingly, the alignment of the infrastructure proposals across the organization to the scientific future priorities of the JRC is not guaranteed,

R.002.VI The JRC's Director General should mandate a senior corporate scientific role to overview the continuous alignment of any scientific infrastructure projects with the JRC's scientific strategic goals.

The overwatching role could report directly to the Directoire. Directorate A Units coordinating the Work Programme (for nuclear and non-nuclear research) could support this role.

Such alignment review should certainly take into consideration basic budgetary magnitudes, like credits available for research, ensuring there is a reasonable proportion between infrastructure investment and work to be conducted at the facilities, according to the principle of sound financial management (Financial Regulation, Art. 27).

The preceding recommendation would be classified CRITICAL in standard circumstances, since as specific steps have been taken by the Director General in order to reinforce supervision before further infrastructure projects are initiated, it is downgraded to VERY IMPORTANT. The IAU is convinced that in the absence of appropriate, stable measures, the associated risk has a potential to become actually "critical".

Classification: Very important

Type: Efficiency and Effectiveness

Proposed due date: 3M from the date of delivery of the final report

ICS: 8-Processes and Procedures, 9-Management Supervision;

At the same time, being only an advisory body (and thus having no competence to take decisions), the SMCC does not ensure a real independent technical evaluation of the proposals submitted by the JRC's sites (i.e. to assess if what is requested is really needed by the sites and is not the result of a generous estimation of needs. Currently, the only analysis (i.e. project proposal indicators against OIB standards) is done by the B.4 Unit, being limited by the unit's capacity. Technical analysis should regard at least the size, the price, the type of the building, etc.

When examining the Strategic Infrastructure Development Plan; the evolution of the sites' requests shows an increased degree of similarity, which may conduct to the idea of one site getting inspired by another one.

Besides ensuring the adequate alignment of infrastructure investments with long-term scientific needs (see R.002.VI), the Director General is advised to consider the possibility of placing the 'site management' infrastructure function (as distinct from the safety responsibilities and the sites' licensing requirements aspect, which must be kept local) under the close direct supervision of a Horizontal Directorate, independent from any single Site.

4.1.3 Procedure for handling of Infrastructure Projects

As already mentioned in 4.1.2, the sites' renewal activity has not had a corporate process owner to coordinate it. As a consequence there was no JRC internal infrastructure procedure to guide the sites through the main steps to be followed.

There were Commission wide procedures for those projects which were to impact significantly the Community's budget (the two-steps *procedure immobilière*). A formal pre-approval of the project, before its submission to the approval by the budgetary authority was actually missing. The JRC sites developed a 'silo' approach: each of them has developed its own manner to locally manage the projects, while ensuring the bilateral dialogue with the Headquarters (Director General and Resources Directorate, mostly specifically its Unit B.04Budget). This situation had the following consequences:

(1) The endorsement of a project (for the implementation) amongst several others proposed by the different JRC's sites remained a high level decision taken by the Site's Directors.

Most new infrastructure investments claim to be grounded well justified reasons, e.g. achieving up-graded safety compliance with the hosting Member State's requirements; preventing obsolescence; increasing efficiency goals, etc.. However, a transparent and consolidated 'system of criteria' to support management decisions has not been established yet.

(2) Before getting approved by the Director General, each project was nevertheless allocated an initial budget to start the preliminary analysis leading to the formulation of the final proposal to the Director General.

(3) Although infrastructure projects were described in the JRC strategic plan documents (never formally approved so far, see section 4.1.1), there was a certain lack of transparency promoted by the bilateral dialogue between the single Site and the Director General. Lacking a structured approach, this dialogue varied from site to site, depending on the local Director's pro-activeness, in some cases being formalised (i.e. exchange of documents registered in Ares), in other cases remaining at verbal level and therefore risking misunderstandings or even lack of real communication.

(4) As a result of the above, some sites (i.e. Karlsruhe) engaged in the early commitment of some simultaneous ambitious infrastructure projects (Wing M and the related developments, see 4.4), even before it was ensured at corporate level that there would be sufficient budget available to support the planned infrastructure projects overall – within the time frame of Euratom 2014-2018.

In a context of clear reduction of corporate resources, the JRC will need to carefully analyse and decide over the priority of projects to be implemented in order to be able to support them financially. It is therefore not in line with the current context starting new projects (i.e. preparation of the site, engaging architects for design, etc.) before having a secured agreement with senior management for each project (plus a clear political support, for major projects).

(5) Lessons learned were not shared amongst JRC's sites, nor was the technical expertise fructified when a site started a new project.

The situation has changed recently (July 2013) with the introduction of the 'Handling of Infrastructure Project Procedures'²⁰. The procedure includes a flowchart and 2 detailed sub-procedures which indicate what should be done, when and by whom, depending on the type of infrastructure project and the ceilings put forward by the Financial Regulation (FR). The most important control element introduced by the new procedure is the pre-approval of each project by the JRC Director General.

4.1.4 Conclusions regarding governance

The weaknesses in the governance procedure at the corporate level have resulted in certain behaviour at the individual site level, characterised by submission of more and more projects, having little or very broad justification.

But projects not obtaining the approval of the Director General could translate into

(a) reputational risk (towards the local authorities involved in the authorisation of new constructions) and

(b) financial risk (as site preparation involves not negligible amounts of money).

The two risks have actually materialised in the case of the IET 'new reception building', which was rejected by the Director General (pls. see more details in section 4.3 *Petten site findings*). This resulted in a loss of 500k€ for the JRC.

This risk could be replicated by any other site if there is no sufficient amount of information and timely communication about projects at all levels (between the involved services and at hierarchic level).

The formal approval will secure the commitment of both senior management and the site management for the implementation of the Strategic Plan, allowing only duly justified modifications. In such a situation, financial risks could materialize.

In order to be approved by Senior management, any infrastructure initiative needs a previous in-depth analysis²¹. This involves in most of the cases contracting external parties to deliver services (i.e. conceptual design, geotechnical studies, etc.), obtaining licences and authorisations for constructions, which altogether may amount to several hundred thousands²² of euros, without including the cost of the JRC staff involved. If such a proposal does not get approved (i.e. on the reason that it was too costly in the IET's 'reception building' case) it can mean that either the site in preparation of its proposal or the senior management in the approval process did not adhere to the strategic planning. In such a situation the money engaged for the preparation of the mentioned proposal is lost.

²⁰ http://www.cc.cec/dgjintranet/jrc/intranet/procurement/ipp/index_en.htm

²¹ This can be done by conducting a feasibility study clearly stating the objectives and requirements (i.e. fitness for purpose, flexibility, compliance with Strategy 20/20/20, etc.) on what needs to be achieved (i.e. scientific or administrative facility) against the most efficient ways of achieving it (i.e. building, acquiring, renting).

²² 500.000 € in Petten.

Observation: It is the responsibility of the Authorizing Officers by Subdelegation to provide due and timely justification on the building projects proposal and secure the hierarchical support before engaging any financial resources into the project

R.003.VI The Director General, after having listened to the Directoire, will approve any contract or order of technical services, passing an established threshold, which has the specific goal to develop JRC-owned infrastructures.

The corresponding technical services should cover all the life-cycle of the project, from preliminary studies to definitive executive projects.

A single approval of the Director General can be understood as covering different contracts or orders of technical services regarding the same infrastructure project, provided that the goal and comprehensive budget are made explicit in the note of approval.

Classification: Very Important

Type: Efficiency and Effectiveness

Proposed due date: 3M from the date of delivery of the final report

ICS: 8-Processes and Procedures, 9-Management Supervision;

4.2 INDIVIDUAL FINDINGS - GEEL SITE

4.2.1 Site Master Plan

For the design of the Site Master Plan, the IRMM concluded a Framework Agreement with an architect company. The company made an inventory of the existing facilities and investigated with the Heads of the Scientific Units the scientific needs, suggesting ideas for the Site Master Plan. These ideas were discussed during the management meetings of the Site, which was steering the gradual development of the Site Master Plan. This was thus based on a consensus of all major stakeholders at the site level.

Following the interviews with the site management team, the auditors conclude that the Site Master plan does not sufficiently take into account a scientific long-term perspective. On the contrary, it is based on the assumption that scientific focus of the IRMM will not change dramatically in the future. This is the approach which is actually applied across the JRC Sites, and its risk is reflected in the recommendations R.001 and R.002.

4.2.2 Office building project

Geel site has started implementing its site renewal plan by the construction of the new office building (building 210) to accommodate administrative staff plus the Director's office. As the Site Development plan was still under preparation, it was requested to host in the building some additional Units (i.e Informatics). The initial cost estimate has increased by 50% (from 2,8 Mio€ to 4,2 Mio€).

IRMM commented in the contradictory procedure:

"This is the difference between a first estimate (before the program of requirements was written by the architect) and the real cost after construction".

The construction of a purely administrative building follows the general principle applied in the JRC Strategic Plan: no scientific staff are hosted in it, since they will be grouped together for increased efficiency in their work. Planning reasons supported also this choice, being found best to construct the administrative building and afterwards deal with the current building housing the administrative and scientific staff²³ (the rental cost of temporary offices for accommodating the staff while dealing with the current administrative building would have been near to the cost of the initial estimation of the new building). Finally, separate buildings/compartments for office use increase energy efficiency, since they have less demanding ventilation and cooling needs.

Technical specifications for the building were defined by the architect company following the input given both by the site management and by representatives of the end users (in this case Administration). Agreement has been reached between all the parties (a kind of a pre-contract), making sure that what has been decided to be constructed addresses all needs and thus no further modifications would be allowed. The final choice for the IRMM building has the external 'look and feel' of a standard European Commission office building.

Observation: Good definition of needs sets up a good starting point as well as a point of reference for measuring performance. This is an example of good practice, which should be harmonized all over the JRC's sites.

²³ Not only old but also affected by the fire accident in the past

However, the IRMM, as the other Institutes, did not calculate the estimate life-cycle cost for the different alternatives under consideration. This is the major weakness in the selection process.

Observation: IRMM did not use the building life-cycle cost in the selection process amongst different alternatives.

A fair estimation of the total construction cost is also important for choosing the most efficient and cost-effective project.

[Note: although this observation took physically place at the IRMM, according to the analysis of the audit team is applicable to all future projects of infrastructure, no matter where they will be located].

R.004.I. The JRC Site Management Coordinating Committee (or a relevant corporate body) will make compulsory to include a life-cycle cost assessment in every infrastructure proposal submitted for evaluation. The life-cycle cost assessment will consider all costs necessary for design, construction, maintenance, operation and decommissioning of the concerned infrastructure over its whole intended useful life.

The life-cycle cost assessment submitted will state explicitly the method used, including the estimated useful life used for the analysis. As experience is progressively built, the JRC Site Management Coordinating Committee will steer a reasonable homogenization of all life-cycle cost assessments submitted.

Classification: Important

Type: Efficiency and Effectiveness

Proposed due date: 3M from the date of delivery of the final report

ICS: 8-Processes and Procedures, 9-Management Supervision;

Table 01 below compares the costs estimated for building 210 (when the *procedure immobiliere* was launched) with the actual overall cost of execution.

Table 03: Comparison of actual vs forecast cost for building 210

Cost of building 210	"Procedure Immobilière"	Estimated cost (without contingencies)	Actual cost	Delta %
Construction costs	€ 4,229,731.37	€ 4,229,731.37	€ 4,312,652.76	+1,96%
Contingency 20%	€ 845,946.27			
	€ 5,075,677.64			
Architect / Engineer fee	€ 253,360.91	€ 253,360.91	€ 258,327.90	+1,96%
Contingency 20%	€ 50,672.18			
	€ 304,033.09			
External safety Coordination	€ 14,804.06	€ 14,804.06	€ 15,094.28	+1,96%
Contingency 20%	€ 2,960.81			
	€ 17,764.87			
Total cost	€ 5,397,475.60	€ 4,497,896.34	€ 4,586,074.94	+1,96%

The audit team acknowledges a good execution of the project, within the forecast budget. The cost increase relative to the amount considered in the “*procédure immobilière*” has been less than 2% (one-tenth of the 20% contingency). The contract timeframe has also been respected.

Table 04 compares planned *versus* actually built surfaces for different uses in building 210.

Table 04: Planned versus actually built parameters for building 210

Surfaces	<i>Procédure immobilière</i>	As built	Difference
Parking spaces m ²	40	40	0
Offices m ²	980	980	0
Laboratories surface m ²	0	0	0
Archives m ²	148	148	0
Meetings & Conference rooms	243	243	0
Technical installations m ²	102	102	0
Circulation area m ²	730	730	0
Total building surface m²	2,202.60	2,202.60	0
Staff to be accommodated	75	75	0

The figures of Table 02 show that the construction process fully respected the project, introducing no significant modifications. This is certainly a result of (a) good internal coordination amongst the stakeholders, when determining technical requirements, (b) professional design, including in the project all necessary elements, (c) professional construction management.

Considering that building 210 will finally host 75 staff (actual number which also corresponds to the initial estimate), the audit team has developed basic indicators for the building, included in Table 03. This will primarily serve for the comparison with the OIB standards and also with other sites (see chapter 4.6.3).

Table 05: Key indicators for building 210

Building parameters		Indicator	
Offices m ²	980	Office m ² per staff member	13.07
Circulation area m ²	730	% circulation area in total built area	33.14
Total area to be constructed m ²	2,203	Total built m ² per staff member	29.37
Actual cost of the building	€ 4,586,704.00	Price/m ² (built)	€ 2,082.12
Number of staff to be accommodated	75		

As a reference, the OIB standard for an office shared by two staff establishes a minimum surface of 16 m², i.e. 8 m² per person. Since most of the offices in the analysed buildings are shared, we can see that such a standard is comfortably respected.

4.3 Individual findings – Petten site

No IET buildings were included in the audit sample. However, through the general analysis of documents, and videoconference interviews, the audit has identified aspects worth being included in this report.

The 'New reception building' project for the IET has been mentioned in all strategic documents of the JRC. The JRC Strategic Infrastructure Development Plan 2012-2020 reads²⁴:

'Site renewal:

- *New reception building, including an auditorium and a full size canteen to enable IE-Petten's independence from the ECN/NRG site in terms of security access to adequate meeting and conference facilities.'*

The project is not assigned an indicative value.

The JRC corporate budget approved for 2012 had allocated 500.000 € for the preliminary study and gave an additional cost estimate of 5 Mio€ for the construction. The 2013 budget has reserved 1 Mio€ for the architecture design²⁵, increasing the additional estimated cost to 6 Mio€ for the construction (split in 5.5 Mio€ for 2014 and 0.5 Mio€ for 2015). The budgetary coverage of the project in 2012 and 2013 ensures sufficient means to support the project's implementation, should it be endorsed by the Director General and approved by the budgetary authority. It documents an agreement reached between the Site management and the corporate services.

The governance structure existent in the JRC and described above under the section 4.1.3. *Procedure for handling of Infrastructure Projects*, implied securing the support of the Director General for the project via bilateral discussions with the Site Director. In order to be successful, it was in the interest of the Site Director to do so regularly and transparently.

But in this particular case, apparently the Director General had not been sufficiently informed in advance about the estimated value of the new reception building. In 2013, when the IET submitted its final proposal for the construction of the 'New reception building', the Director General rejected it on the reason that the required budget (6-6.5 Mio€) was too expensive. Site instructed management was to develop a downsized proposal for half that budget. The new proposal is now amounting to 3 Mio€.

The rejection of the first proposal means that the 500.000 € spent for its preparation are likely lost. The new proposal will need to go through the same procedure, incurring in additional cost.

An audit recommendation will not be formulated, since these aspects were already treated under section 4.1.4.

²⁴ Chapter 4. Site development Plans, 4.4. Petten, pag. 16.

²⁵ as 'credits in reserves' upon the approval of the project by the Director General and successful passing of the two-steps' procedure immobilière'

4.4 Individual findings for Karlsruhe site

4.4.1 Site Master Plan

The preparation of the Site Master Plan at the ITU, which took place during 2011, was coordinated by the former Head of Management Support Unit' which at that time included the site infrastructure group.

According to the latest information (Site Master Plan, JRC's budget, interviews) the ITU is planning to include in the Site Master Plan a large investment for a nuclear building, the so-called wing M. Budget for the preparation of the project was already allocated in 2012 and 2013. However **the project has not been formally approved by the Director General yet.**

The ITU explained in the contradictory procedure:

"In his letter to the Baden-Württemberg (BW) Ministry dated 10 November 2005 (D(2005)28640) the Director General of the JRC communicated to the Ministry that an envelope of 30 million Euro was foreseen for establishing a new controlled area and modernising the Karlsruhe site. Although the project was not formally approved by the DG, the continuation of the preparation of the file was agreed by the DGs (see Ares(2011)437363 and annexes)".

According to the ITU, the request to develop what has currently taken shape as Wing M came already in 2003 from the German authorities. They asked for a comprehensive security and safety update of the building infrastructure in order to cope with the established emergency scenarios (i.e. impact from airplane military standard, earthquake, etc.). The infrastructure should be able to contain within acceptable limits any ensuing release of radiation and radioactive substances. Basically, the technical implications of such a request have led to the design of a bunker-type building (with a thick concrete shell), within which any significant amount of radioactive materials must be kept and manipulated.

However, the information received from the Head (acting) of Unit A8, 'Nuclear Safety and Security Coordination', and supported by the Site Master Plan²⁶, presents a different configuration of the site planning, namely:

- Wing M will only include "small" hot cells for non-irradiated materials. Besides it, the ITU plans to build another new Wing P, intended to replace the existing Wing B currently hosting the hot cells infrastructure and activity.

Accordingly to new information provided by the ITU during the contradictory procedure,

"Many activities conducted in the old wings A, F and G, would be transferred into wing M; At the present, there's no direct request by licensing authority to transfer the hot cells actually hosted in Wing B, as its license (distinct from that for the other wings) allowed/allows the hot cells operations to continue with no immediate limitations.

²⁶ JRC Karlsruhe Site Development Plan 2012-2020, 6.3.2. Hot cells, pag. 11: "However, the operation of the various components of the hot cells infrastructure suffers from unavoidable problems associated with their components, which require at time unplanned interventions causing interruptions that can affect the performance of the work. Moreover, new setups require structural modification to the hot cells infrastructure design which amount to an in-depth renovation of the facility."

*"In contrast to wing M, wing P is still a preliminary concept, without a detailed preliminary plan, and for which no funds have been sought or spent at all. Since its inception the concept of wing P has been included in the medium/long-term site development plan, and was also presented during the mediation process to obtain the license for Wing M specifically to address the potential future development of the site and related issues in full **transparency**. The overall site concept has been well supported by corporate management."*

- Wing B, on the basis of latest information submitted by the ITU during the contradictory procedure,

*"... satisfies the current operational safety and security requirements. Its replacement is not the most stringent requirement today. However, there is concern regarding the resistance of wing B against **"beyond design basis"** accidents which were not foreseen when wing B was built 50 years ago (namely, deliberate aircraft impact, extreme seismic events). Actually no stress tests were made on Wing B. Additionally, as also indicated in the report, there is an efficiency and productivity issue associated with the age of the building and its infrastructure components. **"Beyond design basis"** accident scenarios and efficiency/productivity are the main elements to be taken into consideration in further development of the concept."*
- It seems that a site development plan limited to Wing M would not address the comprehensive safety and security requirements expressed by German authorities for the ITU. An extension developing Wing P or a similar facility is seemingly needed to upgrade the hot-cells installation, so that also for them resistance is ensured against **"beyond design basis"** events.

ITU commented during the contradictory procedure:

"A dedicated study on the option of having an enlarged version of wing M hosting both the hot cells and the hot laboratories currently in wings A, F, G in a single building has not been fully completed but was discussed²⁷. However, it is not evident that such facility would be technically feasible and/or costs efficient. Should it be invoked now, it would require in any case modifying the terms of the licence of wing M and opening a new procedure with the licensing authorities."

The IAU is not in a position to express a detailed technical assessment of these or other infrastructure projects. We can only point out that nothing will ever be **"evident"** unless a rigorous feasibility study has been conducted, exploring all possible options and demonstrably meeting all the requirements expressed by the German authorities.

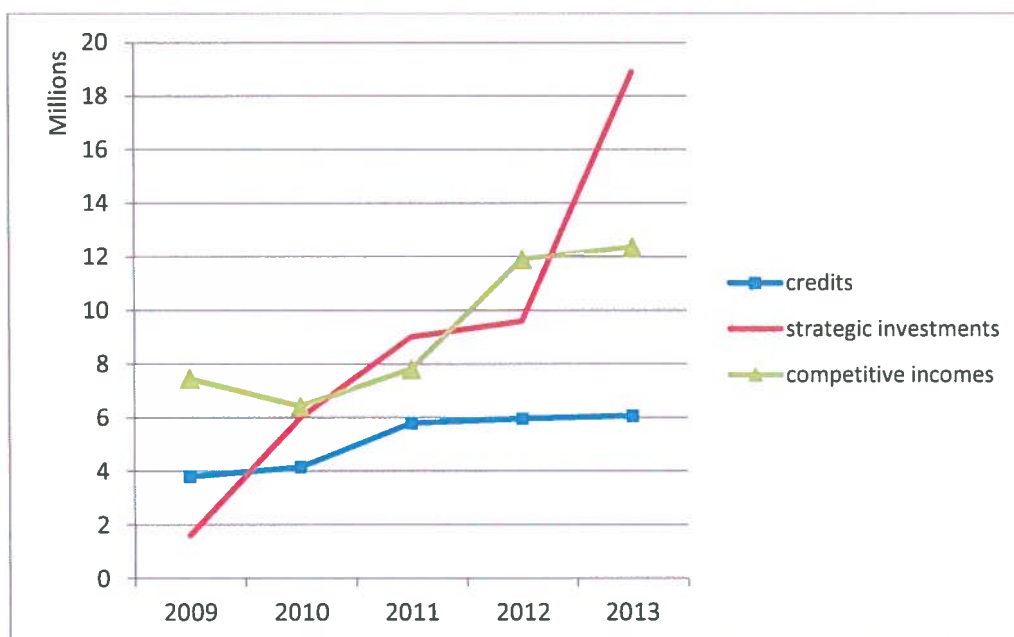
- Upon construction of Wing M, the existing Wing A would be decommissioned and demolished; that space would be used for building new Wing P; subsequently, the Wing B (currently housing the hot cells) would be equally decommissioned and demolished. Such a **sequential scenario**, which additionally includes the projects of new fences, two entrance building for visitors and incoming goods, a building including training facilities, plus the refurbishment of existing wings, **would require a budget of at least 300Mio€ for the coming 15 years**. Significant additional contingencies should be taken into account in order to address uncertainties linked to nuclear decommissioning of two major wings.

²⁷ The reference to the feasibility study (dated 2012) was communicated at the end of the contradictory procedure.

This sum should be assessed against the budget allocated by Council to the JRC Euratom programme for the period 2014-2018, amounting to 185 Mio€ (37 Mio€ per year). This budget should cover operations of the nuclear facilities (through means credits) plus investment in new research facilities, not just for Karlsruhe, but for all JRC nuclear sites. The adopted multiannual budget is fully used on financing the yearly operating expenses of the JRC nuclear sites, leaving very little margin for major investment plans.

It should be born in mind that as a consequence of the current political and economic context, the JRC's nuclear budget has been drastically reduced. According to auditees, there is no realistic expectation to increase it in the short-medium term. Following Recommendation R.002.VI, the JRC should attentively review the long-term logic of investment budgets for infrastructure.

Graph 01: Specific Credits and strategic investments in Karlsruhe



The graph 01 above just depicts the ITU strategic investments in recent years (limited to the office wing NCO) plotted against specific credits and competitive income. It can be readily estimated their significant impact on overhead, even when reckoning on long write-off terms. The full-fledged plan involving the planned Wings M and P would imply investing over 300Mio€. Before green-lighting such an investment, the JRC must absolutely ensure that it is politically and economically proportionate to bind the Institutions to such a long-term commitment.

Exceptionally, despite the importance of these observations, an additional audit recommendation will not be issued, since it is covered by recommendation R.002.VI, referring to the need of corporate scientific coordination, and in particular to the proportionate alignment of resources invested and results expected.

Always in the context set by recommendation R.002.VI, the audit team considers that its development in the case of the ITU will require an in-depth analysis of the whole ITU Master Plan, weighted against the long term scientific priorities of the ITU and the whole JRC.

4.4.2 NCO Office building project

4.4.2.1 Cost escalation in the design phase

The initial estimated construction cost for the new office building was 7Mio€; this sum was defined by the ITU as one of the requirements to be respected by the participants in the architectural contest. The winning project selected by the jury opted for a solution putting all offices together (existing Wing C plus the new modules to be constructed). In order to accommodate this solution, the cost of the work contract published in the contract notice was increased to a maximum of 12 Mio€.

The ITU explained in the contradictory procedure:

“It should be stated that wing C hosting administrative staff required complete refurbishment with estimated costs around 5M EUR. While including the former wing C in the structure of the new NCO building, the refurbishment costs were then embedded in the overall project.”

During the initial fieldwork, the audit team had asked explicitly for this estimation study, however it had not been delivered by the closure of the draft audit report.

4.4.2.2 Cost escalation in the construction contract

With the construction design, the ITU organised a restricted tender procedure, which led to the award of the building contract to the winning company for 13.4M€. This represents an additional increase of 12% over the amount established in the contract notice.

The final impact of this cost increase is unknown yet, since **a comprehensive assessment of the life-cycle cost of the building has not been conducted** (see 4.2.2, pg. 20). As an example, the long-term maintenance, cleaning & energy cost for the glass façade and internal partitions –a fundamental, distinctive trait of the design chosen– has apparently not been assessed against other alternatives.

The cost increase not only shows a lack of vision (poor planning, no clear budget and accordingly no clear type of project – expansion vs. construction of a brand new building), but also difficulties in coordination at corporate level.

4.4.2.3 Numerous addenda to the work contract

The construction works were concluded within the delay stated in the work contract, respectively between April 2011 to December 2012/ February 2013.

During this period, a total of **29 amendments** to the work contract amounting to **1,842,062.83 € (an increase of 13.6% of the contract value)** were concluded. Amongst them there were amendments absolutely necessary to correct **major flaws in the original planning** (raising doubts about the performance of the architectural team chosen for the project):

- Amendments n. 17 –€ 19,395– and n. 19 –€ 20,157– necessary to solve the difference of level between the existing wing C and the wing D, lift of the substructure and of the passage area.
- Amendment n. 20 –€ 119,485.46–for the supply and installation of an access control system.
- Amendment n. 21 –€ 360,636.60– providing of a heating transfer station.
- Amendment n. 23 –€195,000.00– construction of a vehicle parking space.

Amendment n. 3 –€ 245,828.60– regards a modification done after a structural review, whose result, according to the text , *“has shown that a new approach (concept) regarding carpentry work, which could not be predicted in advance of the tender procedure, is required”*. In fact the contract amendment combines together really heterogeneous elements (e.g.a kitchen furniture and steel stairs), which goes against the recognised good practice. Other changes (i.e. Amendment 10) derive from changes already made to the project and/or further alignment with the building's design.

Such an abundance of changes are often a tell-tale sign of poor architectural design and/or poor construction management.

4.4.2.4 Overview of the project costs

Table 04 below shows the evolution of cost along the implementation of the whole project, from the architectural contest till the delivery and commissioning of the NCO building. Besides the already mentioned increases in the project cost up to the signature of the work contract, the ITU has also consumed the entire contingencies foreseen in the work contract for exceptional situations. They amount to 20% of the value of the work contract, with an absolute value of 2,7 Mio€. In such a way, the total cost has reached the amount presented to the budgetary authority under scenario B, i.e. 18.989.273€.

Table 06: Evolution of project's cost for the NCO building

KARLSRUHE - NCO Building				
purpose of the contract, foreseen amount for the works 26/01/2009		note to the budget authority budget project 24/02/2011		expenditures
		works	€13,488,561.00	
		contingency 20%	€ 2,697,712.20	
Total Works	€ 7,000,000.00		€16,186,273.20	€15,330,623.83
architects (selection 08/2008)	€ 790,000.00			
20%	€ 158,000.00			
architect fees	€ 948,000.00	architect fees	€ 1,200,000.00	€ 1,420,000.00
		contest	€ 124,000.00	€ 40,671.85
		construction authorization	€ 50,000.00	€ 74,526.00
		Expertise	€ 53,500.00	
		Construction site preparation	€ 555,500.00	€ 540,948.00
		Containers	€ 252,000.00	€ 388,750.00
		Dismantling Wing C	€ 168,000.00	€ 175,650.00
		Furniture	€ 400,000.00	€ 837,256.00
TOTAL	€ 7,948,000.00	scenario b	18,989,273.20	€18,808,425.68

In a comparison with the costs of a brand-new building, it should be noted that the NCO building has incorporated the structure and foundations of Wing C, which already existed. Even accounting for the cost needed for dismantling other elements of the own building (168k€), the net balance should be certainly positive.

4.4.2.5 Overview of the project parameters

Table 05 shows the changes occurred during the project's implementation, comparing surfaces planned in the project (reported in the *procedure immobilière*) with surfaces effectively built.

Table 07: Planned versus realised parameters of building NCO

Surfaces in m ²	Procedure Immobilière	As built	Delta %
Parking spaces ²⁸	0	120	n.a.
Offices	4879.3	3735.3	-23%
Laboratory surface	0	0	0
Archives	498.6	542.7	+8%
Meetings & Conference rooms	507.1	785.3	+55%
Technical installations	525	484.4	-8%
Circulation area	2380	2330	-2%
Total	8790	7880.7	-10%
Staff to be accommodated	300	310	

The final built surface is 10% less than the surface in the project. Accordingly, an approximately proportional decrease of costs could have been expected. Contrary to this expectation, the total costs stayed roughly the same, and of top of it, the substantial contingency (20%) was fully consumed.

On the base of the parameters of the building, the audit team has calculated basic indicators for the NCO building. As in other cases, this will primarily serve for the comparison with the OIB standards and also with other sites (see chapter 5.1.2).

Table 08: Key indicators for the building NCO

Building parameters		Indicator	
offices m ²	3735	office m ² per staff member	12.04
circulation area m ²	2330	% circulation area per total built area	29.6%
total built area m ²	7880	Total built m ² per staff member	25.41
Actual cost of the building m ²	€ 18,808,425.68	Price/m ² (built)	€ 2,386.85
Number of staff accommodated	310		

It is worth pointing out that an indicative theoretical price/m² (planned) could have been calculated using the planned cost (minus contingency), i.e. €16.291.561, and the planned surface 8.790 m², obtaining 1.853 €/m². The marked increase (+28%) in the final price/m² combines the effects of the full use of the contingencies with the decrease in the built surface.

The OIB standards for a two person shared office indicate a minimum of 16m² for the shared office.

The necessity of constructing or extending the old offices building (Wing C) came with the requirement from the German government, which requested that scientific staff working in the labs should have a office space outside the control area.

²⁸ Rigourously speaking, do not belong to building NCO, but to the infrastructure external to the ITU's security perimeter, although the relative costs were included in the project.

The new NCO office building was conceived to accommodate also administrative staff. As reported by the ITU in the contradictory procedure:

“Accordingly to late information, the scientific staff should work and share the working time between the controlled area and the new building where it was provided with individual working spaces.

The offices in the controlled area have been evacuated and are not used as office space.

Actually the ex-office rooms in the controlled area will not be dismantled. Plan developments and discussions on how to use the empty space in the ex-offices are ongoing, involving the supervising authorities. Several rooms have been redeployed already to improve operational aspects in the wings.”

The issue of cost efficiency use of resources is rising. It does concern primarily the design of the new NCO building. The ITU could have perhaps saved resources through other designs, yet accommodating the safety requirements in an efficient manner, according to the specificity of the working environment²⁹.

ITU commented in the contradictory procedure:

"Access to the controlled area of ITU is regulated. For safety reasons, working in the laboratory can take place from 8 to 12 am and 13 to 16 pm (see Institute Handbook, belonging to the ITU nuclear licence). After 16:00h working in the labs is not allowed (needs special safety staff support). After 16:30h any presence in the labs must be subject to special authorisation. The actual working time of the scientists goes well beyond 16:30h. Moreover, a significant component of the work of a scientist is writing publications, which must be performed outside of the controlled area."

Moreover, the look of the new building appears too much into a fashion trend especially when compared to the other JRC buildings built for similar purposes. This choice has implied higher cost for the materials and technologies used for the building and also resulted into a limited flexibility. The additional acts to the work contracts show that once a modification was needed, other parts had to be adapted to the change, as they were not fitting anymore to the general design of the building. One should bear in mind that this scenario will also apply for future interventions and maintenance.

According to the auditees, the building doesn't seem to have any characteristic of flexibility, because in case of needing of changes or improvements, the internal distribution cannot be adapted.

Another issue refers to the energy efficiency and the running costs of the building, since it is mostly a 'glass building'. Maintenance and cleaning will represent a significant share of these costs (i.e. the glass needs a regular cleaning, and it represents a big percentage of all structure).

With regard to the energy efficiency, although the technologies employed for the building are ones of the most advanced, the ITU could not indicate the level of the economy of energy resulting from the use of the new building. Moreover, the selected technologies are not flexible to potential subsequent up-grading needs.

²⁹ During our visit we could see that the NCO building comprises offices for 2 persons displayed on the exterior walls of the building and common spaces like VDC facilities and meeting rooms in the central area of the building. **The ITU has provided the technical coordinates of the building during the contradictory procedure.**

The ITU explained in the contradictory procedure:

“There is an “Energieausweis” which was provided to the auditors stating a value of 202.8 kWh/(m2.a) (limit for new buildings in Germany is 250 kWh/(m2.a)). The energy monitoring (2008-2013) shows that there is no significant increase of the energy consumption despite the fact that the surface occupied increased, but just the contrary when comparing energy consumption per m2.”

For completeness, IAU explains the need to evaluate the energy saving of the NCO building, comparing it to other architectural options. The choice of the architectural design was supposed to be made on the basis of energy saving, that's why the life-cycle cost study would be necessary to compare the real consumption savings.

4.4.2.6. Purchase of paintings for the NCO building

In 2012 the ITU has decided to acquire works of art (paintings) for decorating the new building. According to the Note to the Director of Resources³⁰, these items were to 'give a final touch to the welcoming image' of the building. The Note provides an indicative value of the works of art which could be acquired according to the German legislation up to a ceiling of 2% of the construction cost (around 380.000€ in this case), while recognising that the JRC has no obligation in this regard. It proposes a budget of 200.000€ for the contract.

Although in the same note the ITU indicated that the appropriate procedure for the procurement of the items would be an open contest with the participation of a jury and of art experts, it added that

“is not recommended in this specific case, because the cost for the organisation of the contest would be much higher than the items themselves.”

The same note proposed a procedure to be followed organised in:

- a “pre-selection phase” (08-11/03/2012) for choosing the art-gallery “Florian Trampler”, without providing information about who was responsible for this choice, and
- a “confirmation phase” (16/08/2012), in which a panel confirmed the good choice of the gallery, after viewing some of its typical items.

In reality, the procedure had already taken place when the Note was issued; it is undocumented how it was decided.

The ITU decided to award the contract to a particular economic operator, on the basis of the provisions of the Art. 91(d) of FR and Art.126 (b) IR³¹ of the old FR. Subsequently the ITU issued two Request orders³² split on two different years, amounting to € 145.270,00³³, for a number of 8 paintings. The paintings are neither funded nor reported under the project's budget. In the opinion of the audit team, there is no outright technical justification for splitting the contract.

The procedure used by the ITU is reserved for exceptional situations which should be duly justified by the contracting authority, like for instance: 'exclusive rights', 'technical

³⁰ Karlsruhe, dated and coded 14/09/2012/JFB (not recorded in ARES).

³¹ Art. 126 IR: Use of a negotiated procedure without prior publication of a contract notice (Art. 91 FR).

Contracting authority may use the negotiated procedure without prior publication of a contract notice, whatever the estimated value of the contract, in the following cases...: b) where, for technical or artistic reasons, or for reasons connected to the protection of exclusive rights, the contract can be awarded only to a particular economic operator'.

³² RO 223558 from 23/10/2012 in the amount of 70.000€ and RO 225385 from 17/05/2013 in the amount of 75.270€.

³³ The total amount includes concept, transport, insurance and installation costs

monopoly' and/or 'captive market', as specified by the provision in force. The purchase of works of art does not fall under any of these exceptions.

In fact, the JRC Procurement Guidance on Captive Market Negotiated Procedure³⁴ reads the following:

“II CONDITIONS FOR "CAPTIVE MARKET" NEGOTIATED PROCEDURE

*According to Article 134(1)(b) RAP the captive market negotiated procedure can be used when:
(1) there are technical or artistic reasons, or exclusive rights, connected to the subject-matter of the contract...*

' Artistic reasons

The need for a particular provider for artistic reasons could exist where an entity wishes to purchase a unique work of art, or to contract with a particular artist or performer — for example, a photographer, or an artist for painting murals."

In Commission procurement practice, these reasons are almost never invoked'.

Moreover, the prices included in the offer submitted by the external provider are those identified in the Request Orders (no negotiation took place).

The IAU contacted the Unit B5, in its quality of corporate process owner, in order to have a consultancy whether the requirements for the application of the Article 134.1(b) existed and opinion on the correctness of the operation.

According to Unit B5's answer³⁵:

"B.5 was not consulted on the above mentioned purchase and from the examination of the available documents in JIPSY we are of the opinion that the recourse to Art.134(1)(b) RAP was not justified" and "As negotiated procedures above EUR 60.000, both purchases should have been submitted to the PPAG. The available documentation in JIPSY does not contain reference to a PPAG review nor any Note to the PPAG secretariat about the AOS decision not to consult the PPAG".

Summing-up, our assessment of the situation identifies several simultaneous irregularities:

- Proposing significant additional expenses, unrelated to any legal requirement, in a situation of major cost overruns,
- Not documenting the procedure except for an *ex-post* Note, which was not recorded under the JRC's document management standards,
- Applying without proper justification a purchasing procedure strictly reserved for exceptional situations.
- Splitting the comprehensive amount of the contract into two years, without an adequate technical justification.
- Not submitting the dossier to the PPAG, as it would have been required by its cost.

³⁴ Last up-date 20/09/2010.

³⁵ Email of 17/02/2014 from B.5 HoU Iain Formosa to IAU HoU Stanislav Drapal.

Observation: Engaging public resources for the acquisition of items (of leisure) not related to the JRC's activity is contrary to the principle of sound financial management enshrined provided by the art. 30-31-32-33 of FR.

By using the exceptional negotiated procedure in a situation which does not justify the use of this procedure, the ITU has infringed the rules of the Financial Regulation and of the Vade mecum for the Public Procurement exposing the JRC and the Commission to a reputational risk.

Despite the gravity of the findings, an audit recommendation is not issued in this case because the damage to the interests of the European Commission has already materialised.

4.5 Individual findings – Ispra site

4.5.1 Management of the 'buildings 100 and 101' project

Managing complex contracts is an exacting task requiring vigilance and clear assignment of roles and responsibilities³⁶. The particular case of the simultaneous construction of two buildings belonging to the 'Science Zone' becomes especially complex project to be managed, with significantly increased risks. Management of such projects requires monitoring of individual contracts both from the administrative and technical points of view, but also their coordination so as to avoid gaps in the scope or contract duration.

A number of issues have been identified by the audit in relation to the contract management of the 'two-building' project.

4.5.1.1 Multiple contracts for the design and work supervision

Ispra site organised an architectural contest for the selection of an economic operator to provide 'design, assistance with the tender and work supervision' services for the new 'Science zone' area. Following the contest, the contract was awarded to the company Architecture Studio SAS.

The JRC ISD – Ispra Site Directorate signed the contract n. 482384/06/12/2006 for duration of 10 years, with a temporary undertaking³⁷ led by the Architecture Studio SAS. After only one year, upon delivery of the first lot of the contract –the updated preliminary design for the new 'Science Zone' area–, the ISD unilaterally terminated the contract with Architecture-Studio SAS³⁸.

According to the comments made by the ISM (Directorate which has substituted the ISD) during the contradictory procedure, the Architecture Studio SAS

"had the intention not to respect the total budget mentioned in the architectural contest and refused to follow the invitation from the Commission to strictly limit the construction costs of the two buildings to this budget. It was therefore impossible to continue the normal working relation with this company... The termination letter dated 13.12.2007 states clearly that the economic aspects of the updated preliminary design are such that the JRC decides not to go ahead with the project on this basis".

The audit team interviewed also the former Director of the Ispra Site Directorate, at that moment responsible for the management of the Site, in order to better clarify the reasons for the earlier termination of the contract. He confirmed that indeed, from the exchanging communications, the reasons don't appear clear, but that the decision was taken on the basis of continuous delays, of a not economically sustainable estimation of the total cost and (after a thorough analysis) of continuous risks from other bidder.

³⁶ General Role and Responsibilities of the Contract Manager:
http://www.cc.cec.dgintranet/jrc/ismnet/msu/procurement/rules_documents/contract_manager_roles_ism-msu_pro_v1.0_20100721_en.pdf.

³⁷ And composed by Hilson Moran Ltd and Tekne Spa.

³⁸ In accordance with Article I.1.2.3 of the Administrative Conditions, the Commission, upon submission of the Updated Preliminary Design, reserves the exclusive rights to decide with respect to which facilities the services shall be further implemented or, in alternative to terminate the contract.

The audit team has verified that:

- The actual amount (about 60 Mio€) spent for two buildings and the first amount committed for the third building already exceeded the construction costs foreseen by Architecture Studio SAS (about 64 Mio€, but referring to four buildings canteen and entrance included).
- After the decision to terminate the contract, Architecture Studio SAS sent some communications stating that they did not understand the reasons for that decision, and asking for its review.

Although the auditees provided further information during the contradictory procedure, the IAU still considers that neither the correspondence contained in the file nor this further information provide clear reasons justifying the contract's termination.

Should the above mentioned reason have been the base for the contract termination, then the JRC has been exposed to financial and reputational risks which could have been materialised by potential litigations claims formulated by other participants to the tender. On the other hand, it seems that *with its decision, ISD tried to avoid potential risks linked to a bad performance of Architecture Studio*.

Following this decision, the ISD was in the position of having no architect designer for advancing the project. It then referred to the already existing Framework Contract for 'architectural, engineering and urban planning' with Politecnica - Ingegneria ed Architetti (FWC 481538 valid from 02/03/2007 to 06/03/2010).

For the supervision of the construction works, the ISM launched a call for tender procedure, concluded with a direct service contract awarded to Intertecno Spa and MSC Associati (C 486558 valid from 02/03/2010 to 09/03/2015).

The use of the framework contracts although provides some flexibility, has its limitations – duration (up to 4 years) and ceiling value.

It was the case of Politecnica's framework contract, which had expired by the time when the construction contract was signed and the work should have been started. The ISM, for a second time, had no contractor for design and urban planning services. After 8 month, in November 2010 a new FWC for 'architecture, engineering and urban planning' was signed with Intertecno, after another call for tender procedure, the scope of the contract being this time for the entire Ispra site and not only for the specific project.

The design services for the uncovered period of 8 months (from March 2010 to November 2010) was re-negotiated and assigned to the constructor ARCAS, by amendment to the direct contract.

Besides the direct work contract, the ISM concluded, after a different call for tender procedure, a FWC with ARCAS, for the same type of works and services as those included under the direct work contract, the FWC covering the entire site.

ISM declared in the contradictory procedure:

"The award of 2 contracts to the same contractor, one direct for the construction of the buildings 100-101 and the other one framework for works to construct, restructure and maintain buildings at the Ispra Site, was the outcome of 2 different procurement procedures carried out independently which both formally received positive opinion from the PPAG".

Table 07 below shows the overview of the contracts regarding the construction and the consulting works linked to the project.

Company	Procurement procedure	Contract type	Object of the contract	Contract n.	Duration	From	End date	EXCEPTION	Price of the contract	Invoiced
Architecture-Studio SAS Hilson Moran LTD Tekne Spa	Open Procedure	Direct Service Contract	Design Assistance with tender Work supervision	482384	10Y	06/12/2006	19/12/2007		€ 5,153,152.95	€ 351,351.20
POLITECNICA	Open procedure	Order letter under existing FWC -Services	Architectural, engineering, urban planning	481538	4Y	07/03/2006	06/03/2010		€ 3,600,000.00	€ 1,820,556.00
INTERTECNO SPA	Open Procedure	Direct service contract	Work supervision	486558	5Y	02/03/2010	09/03/2015		€ 3,418,450.00	€ 1,732,000.00
MSC Associati										
INTERTECNO SPA	Open Procedure	Order letter under FWC -Services (first ranked)	Architectural, engineering, urban planning, work supervision	487299	4Y	11/11/2010	10/11/2014		€ 6,100,000.00	
MSC Associati										
TEKNE	Open Procedure	FWC-Services (second ranked)	Architectural, engineering, urban planning, work supervision	487300	4Y	11/11/2010	31/10/2014		€ 462,034.00	
ARCAS	Restricted Procedure	Direct Work contract	(Construction work for building 100+101 and related site construction works	486507	5Y	02/03/2010	20/09/2015	Design services 8 months	€ 35,225,018.00	€ 31,135,148
ARCAS	Open Procedure	Order letter under FWC	execution of construction works, civil engineering, plant engineering and electrical mechanical concerning the construction, renovation and maintenance of buildings of civil and related infrastructure	487366	4Y	21/12/2010	20/12/2014		€ 13,000,000.00	€ 10,812,367.00

Table 09: Overview of the work and consultancy contracts linked to the buildings 100 & 101

During the audit interviews the ISM senior management affirmed their intention to terminate the work supervision contract with Intertecno before its expiration, due to complaints related to the quality of Intertecno's services. Even if in the case of Intertecno, there was a proven bad performance of work (and the IAU appreciates the steps taken by the current ISM management to improve the situation), the audit remarks recurrent issues with the contract management. Repeated termination of contracts (before the agreed duration) is not a good practice, and as a matter of fact it generated difficulties in the continuation of the project.

One can argue that the project in question is very complex and the JRC is still learning from this process, which anyway does not belong to its core activities. On the other hand, changes in management have occurred at all levels since the beginning of the project (i.e. from the Director General, ISM Director, Scientific Institutes Directors and even the Head of C.5 Unit to the technical responsible of the project), having some influence on the entire process, either due to decisions in order to change the project itself, or because of change in the management approach.

Notwithstanding that, the way the contracts were replaced and/or complemented reflects risky contract management (i.e. poor coordination, poor relationship with the contractor, or even poor evaluation and selection during the procurement process, considering the issues with Architecture Studio or the current issues with Intertecno).

The mixed use of framework and direct contracts (concluded with the same or different contractor) for such a complex project makes difficult the tracing of costs associated to the project, while it might impact the coordination of the work with the work contractor.

It exposes the organization to a serious risk, i.e. market alteration. Costs could be shifted intentionally out of the single contract, placing them under the framework contract.

Costs can be followed-up by contract (in Jipsy and in ABAC); accordingly when a framework contract is for the entire site, there is no clear audit trail of the cost per every single project dealt with under the framework contract.

In fact for following-up the project execution and reporting of forecasted costs against the real ones, staff of B.5 Unit 'Finance and Procurement' keeps a detailed Excel table, which is up-dated manually (issues of accuracy, reliability of data). This situation is not limited to the Ispra site.

At central level, in order to facilitate cost reporting, the B.4 Unit has created individual budget lines (local positions, as from 2011 onwards) per building. If all costs related to a building project are booked by each Institute to the individual local position, than the real cost of the building is traceable. However, if the Ispra Directorates, not just ISM, book costs also to different budget lines, as it is the case, the cost of the project is not traceable anymore. The manner the costs are booked depends entirely on the Directorates' approach.

According to the B.4 Unit, the reality is that institutes sometimes make wrong postings, allocating expenses to other projects. When the same contractor has different contracts (as it's the case of Ispra) and is engaged in different works on the site, it is not evident to identify the exclusive expenses of a certain project from a given invoice.

Also the concept of costs associated to a certain building is not so clear. For instance in Ispra there are some works in the surroundings (parking, gardens, etc.) and this may not be or may be considered at least in percentage party of the cost of the buildings.

It seems that Unit B.4 has tried to identify & follow all these issues in order to identify all real costs related to the buildings, but this became a time-consuming task; the Unit lacks the resources necessary for a detailed control.

The absence of cost-accounting or project accounting in the financial systems of the JRC makes difficult for Unit B.4 Budget Accounting and Competitive activities to trace all costs related to the building. In this context, the use of several very different contracts regarding wholly or partially the new buildings poses an additional difficulty.

On the other hand, during the contradictory procedure, ISM remarked that:

- a) *since the 1st of January 2012 due to the new organisation and the centralisation exercise ISM units have no more staff allocated for accounting matters which fall under the competence of Directorate B;*
- b) *the JRC has no adequate tool for cost accounting of these big building projects.*

About the second point, the auditors could observe that the Unit B.05 completely report the costs of the project in the excel file, nevertheless they also agree that a valid tool for the accountancy of the projects needs to be developed.

ISM explained in the contradictory procedure:

"Normal tools available in the ABAC environment together with unit B5 staff personal engagement and professionalism enable to follow and identify all the contracts linked with a specific infrastructure project and the related costs. Moreover, in such complex projects, it would prove unfeasible to sign an exhaustive contract that would cover all the smallest details linked with a 3 year construction process of more than 20 000 sqm of building. The direct contract is therefore necessary to cover the main and foreseen construction activities, whilst the use of any other type of available contracts like a FWC is useful to cover unforeseen activities. The contract for the new buildings has been signed in March 2010. The supervision of the works foreseen in the contract was done by a company (Intertecno). This decision, dictated by the very scarce internal human resources dedicated to this project, may sometimes have gone against the Commission interest because the payment of the supervision company is proportional with the value of the payments done to the construction company.

In 2011 there were already a lot of changes requested by the Institutes, endorsed by the supervision company, but without the contractor agreement regarding the associated time and costs. The ISM Director decided to start immediately the direct negotiations with the company in order to respect the "procédure immobilière" ceiling and to obtain the commitment of the contractor regarding time and cost. The various steps of the negotiations have been regularly reported to the JRC DG (see note ARES (2012)207593 – 23/02/2012 and ARES(2012)1286473 – 30/10/2012). The negotiations were tough due to the obstruction received from the supervision company (significant difficulties to have access to all information about the status of the works) but also due to the significant change requests already mentioned that culminated in March 2012 when an Institute Director decided unilaterally to change one floor layout from laboratories to offices (see note ARES(2012)303104 – 14/03/2012). An agreement with the contractor has been however reached with favourable conditions for the Commission. An amendment to the contract has been signed in January 2013 (see note to JRC DG, ARES (2013)168776 –

08/02/2013)... *The commitments were respected and the new buildings have been officially inaugurated in October 2013*".

The audit has identified that in the execution of the work on the two-buildings project, the ISM used the FWC with the constructor ARCAS for 'purchase and installation of an equipment related to the air conditioning system in the laboratories' for a value of 1.2Mio€. The cost was correctly reported under the project in the excel table, however it is unclear why the ISM referred to ARCAS framework contract and not to the direct work contract specifically concluded for this project, through an amendment (as it was already done for other changes).

ISM declared in the contradictory procedure:

"As mentioned above, there was no intention to multiply amendments to the initial contract signed with ARCAS. Moreover, the air conditioning system in the laboratories was explicitly excluded from the works subject to the call for tender procedure. It has therefore been considered inappropriate to include these works at a later stage through an amendment as it may have been interpreted as a substantive distortion of the initial contract subject to the procedure of call for tender".

Cost related to additional infrastructure elements which are built in order to support the full 'Science Zone' area or even the entire site are difficult to be attributed to the two-building project. This is particularly hard because of the Art. 203, 3 FR and 286 of RAP do not specify with details what should be reported as the cost of the building³⁹.

Table 08 below shows how the total cost evolved starting from the first estimations. It has to be noted, that even if the "*procedure immobilière*", approved € 34,865,000.00 for the works, the JRC awarded the contract to the ARCAS company receiving a special discount of 10% in case of a contemporary authorization to build the two buildings.

This authorization was given since the day of the signature of the contract (02/03/2010), so the starting amount to be considered for the works and including the 10% of contingency, should be: € 30,807,233.43.

Actually, the cost of the works (due also to an addendum agreement, made because of lack in the technical specifications), amount to an estimated final cost of € 36,472,357.00 registering an increase of 19,3% on top of contingency.

The Institutes spent much less regarding the overestimated amount for "Equipment and supplies for labs", (2,99 Mio€ against the estimated 5,9 Mio€) and this allowed to be under the total amount approved by the "*procedure immobilière*". This relevant underspending raises some doubts: either the initial cost estimate was of rather poor quality, or it created, in some way, an extra "hidden" contingency.

³⁹ Art 203.3. *Each institution shall provide the European Parliament and the Council, by 1 June each year, with a working document on its building policy, which shall incorporate the following information:(a) for each building, the expenditure and surface area covered by the appropriations of the corresponding budget lines;*

Art 286 RAP *The expenditure referred to in Article 203(3)(a) of the Financial Regulation shall include the costs of the fitting out of buildings. It shall not include the charges.*

It has to be noted, that during the execution of the works, it was also decided to convert a whole floor destined for laboratories to offices, (floor, building, square meters); the cost impact of such a change is uncertain.

A foreseen bonus for an earlier conclusion of the works, amounting to 3% (€ 887,00.00) of the total amount of the contract, was not assigned and this allowed to avoid additional expenses.

Nevertheless, considering all the correlated expenditures and the cost for the furniture of offices⁴⁰ and labs, the total actual cost for the two-buildings project amounted 39.7 Mio€, with an estimated final cost of 44.2 Mio€.

The report was based on data updated in October 2013. During the contradictory procedure (spring-summer 2014), the amounts indicated by the auditors were corrected accordingly to the latest information based on data updated in July 2014.

The actual total amount, compared to the amounts of October 2013, was reduced of almost 4.0 Mio€ (from 45,4 Mio€) mainly due to:

- the decision of re-considering the Heat Pump System as a self-standing project and consequently not assigning part of its cost to the overall project. At the same time, the cost of the photovoltaic systems was now included; once again, it must be noted that these decisions regarding changes blur the accounting records and make extremely difficult an accurate cost monitoring.
- a wrongly double registration of a payment in Jipsy,

Nevertheless, the IAU considers that the deficient contracts execution management for the "two-buildings" project (both for design and execution) is the direct cause of the recorded overspending. The main upstream reasons are poor-quality cost forecasts, lack of coherence with the scientific strategy, and poor overall project management.

In this project, the JRC organization has clearly ventured into waters far away from its core competencies; it should ponder carefully whether to do it again, and if so, with the help of which planning and monitoring systems.

⁴⁰ Not included in the *procedure immobilière*, but increased because of the late decision to convert laboratories in offices, so partially attributed to the total cost of the project.

strategic plan 12/2006	contract notice 15/07/2008	Procédure immobilière information and budget autoritaires 17/11/2009	(discounted) contract 02/03/2010	addendum to the contract 18/12/2012	Invoiced	Estimated final cost
Consultancy equipments and supplies for labs		consultancy	consultancy		€ 3,409,754.00	€ 3,536,651.00
		IES			€ 1,167,339.00 <i>Lab connections (Trox)/Fwc-ARCAS)</i>	
		IHCP				
		10% contingency				
Subtotal Equipment and supplies for labs		€ 3,142,000.00 € 2,500,000.00			€ 2,696,456.00	€ 2,826,985.00
TOTAL		€ 5,970,000.00 €43,977,000.00			€38,311,123.00	€ 42,835,993.00
			Clean room furniture (M+W Italy contract)		€ 88,800.00	€ 88,800.00
			Labs furniture (Ferraro contract)		€ 641,665.52	€ 641,665.52
			FURNITURE OFFICES (not considered in the total budget)			€ 117,800.00
			Supply (fwc Dromeas OIB) 13% of total, as one floor foreseen for labs was converted in offices		€ 117,800.00	
			Subtotal Furnitures		€ 848,265.52	€ 848,265.52
					€39,159,388.52	€ 43,684,258.52
COLATERAL EXPENDITURE						
Photovoltaic			€ 208,648.00	100%	€ 208,648.00	
Energy supply from renewable sources (heat pump system) DESIGN + SUPPLY + WORKS+ SAFETY			€ 1,939,597.00	15.00%	€ 290,939.55	
Sewage system. Final Working Design, work supervision, safety (Intertecno) and execution			€ 850,000.00	0.00%	€ -	
Green Areas.WORKS Execution and SUPERVISION			€ 88,158.00	100.00%	€ 88,158.00	
Roads & Parkings (SIS) + Equipment (TGS), including car shelters for photovoltaic use			€ 630,765.00	0.00%	€ -	
Data Center			€ 1,400,000.00	0.00%	€ -	
Sub-total COLATERAL EXPENDITURE					€ 587,745.55	€ 587,745.55
					€39,747,134.07	€ 44,272,004.07

As shown by the budget tables (it happened also in Karlsruhe, see the relative section) projects, a significant difference between the forecast and the actual costs has been detected.

Sometimes such an increase can be the consequence of unpredictable problems. However, it must be noted that there was already a contingency fund budgeted (10% to 20% according to the country).

With the exception of Geel, the other sampled projects have used this entire contingency up. A plurality of causes have been identified: incomplete planning; problems in contract management and execution; reopening of adopted decisions, translated in frequent changes (some of them of significant impact); an emphasis on aesthetical goals (style, image) difficult to justify for technical buildings built by a public Institution in a context of austerity; etc. The combination of this causes explain the actual situation audited, and the significant overspending of resources relative to initial planning.

Observation: The plurality of contracts, combined with their inefficient management, covering the 'two-building' project in Ispra and with the lack of an efficient tool of cost accounting, has not allowed an adequate traceability of costs during the audit.

R.005.VI. When assessing any new project for infrastructure and buildings, the Site Management Coordinating Committee must consider, at the planning stage, the need to keep the corresponding project accounting under sufficient control all over the development of the project, taking in consideration the constraints imposed by the JRC accounting systems. The developing of a valid tool for the cost-accountancy of the project should be considered.

The Site Management Unit (or equivalent) presenting the project will address this issue in a specific, separate section of the project file. The SMCC will ask for an opinion of Unit B.4 and B.5, when necessary, and will aim to standardise the cost-accounting practices for different projects. Special attention will be paid to avoiding overlaps on the same project of different contracts awarded to the same contractor, whenever they exist.

Along the evolution of the project, the SMCC will report to the Directoire about the evolution of the actual cost of the project, and of the estimate of the cost for completion, following the established cost-accounting plan.

Classification: Very Important

Type: Efficiency and Effectiveness

Proposed due date: 3M from the date of delivery of the final report

ICS: 8-Processes and Procedures, 9-Management Supervision

Table 11: Key indicators for buildings 100 and 101

100- IES-ISPRA			
offices m ²	2480	office m ² r per staff member	11.27
circulation area m ²	3915	% circulation area per total built area	33.8%
total built area m ²	11580	Total built m ² per staff member	52.64
Actual cost of the building	€ 19,873,000.00	Price/m ² (built)	€ 1,716.15
Number of staff to be accommodated	220		
Archives + meeting conference m ²	635		

101- IHCP-ISPRA			
offices m ²	2650	office m ² per staff member	12.33
circulation area m ²	3695	% circulation area per total built area	31.9%
total built area m ²	11580	Total built m ² per staff member	53.86
Actual cost of the building	€ 19,873,000.00	Price/m ² (built)	€ 1,716.15
Number of staff to be accommodated	215		
Archives + meeting conference m	805		

4.5.2 Site level management of the projects

The general Ispra site planning has been presented in the Individual Findings for the Ispra site. This section will only address some governance aspects.

The governance structure for the Ispra site was ensured by the Meeting Construction Coordination Committee (MCCC), which was originally formed by : G. Peter (ISM-C02), G. Tartaglia (ISM-C04), R. Babich, A. Eeckels, J. Garcia Rubi, A. Massaro Lattuada (ISM-C05), R. Stroosnijder, N. Brinkhoff-Button (ISM-C06), N. Hubbard (IES-H01), A. Fusari (IHCP-I01), Ch. van der Aat (President CLP) P. Sprayt (IPSC-G01) and D. van Hattem, ISM Acting Director, then substituted by Mr. D. Chirondojan, actual ISM Director.

Once the strategic investments at the site were started (work for the two-building project), the MCCC organised regular meetings for the coordination of the project.

According to the minutes of the MCCC, there was a reduction of the frequency of the meetings, especially in the last two years. The below graph illustrates it visibly.

Table 10: Meetings Construction Coordination Committee 2010-2013

Meetings Construction Coordination Committee 2010-2013	
year	n. of meetings
2010	15
2011	10
2012	8
2013	3

Besides, the agenda and the issues discussed during these meetings were also themselves reduced, affecting transparency with regard to the status of the project. Moreover, in the first year of its functioning, the MCCC was held with a great number of stakeholders, including the external contractor providing the work supervision; in the last 2 years, the latter was not invited anymore to the meeting, and the JRC staff attending it decreased, as well. Whereas the new method can be attributed to a different management style (management has changed), communication between the ISM and the Contractor – work supervisor, but also towards the customer Directorates has visibly decreased, giving room to potential misunderstandings, misinterpretations, etc. In fact, the relationship with the mentioned external contractor currently presents difficulties.

During the interviews, the ISM's Director has affirmed the intention to keep general project supervision in house and only to externalise the structural, mechanical and electrical work supervision. It has been also mentioned that the relationship with the current work supervisor (Intertecno), has undergone difficulties, ISM staff detecting errors in the mechanical structure of the building, which showed lack of control from Intertecno.

This initiative is laudable, especially in the view of the project contract management history, however, the audit team draws attention on the Note⁴¹ of the Director General, according to which the bulk of staff reduction foreseen for the years to come addresses site management functions.

4.6 Findings common to the sampled projects

4.6.1 Analysis of current premises – energy consumption

The Strategic Plan has identified three principal areas for intervention:

- Site renewal strategy.
- Climate and energy goal.
- Strategic work programme priorities.

The first two priorities underpin the commitment of the JRC of setting up an example for the reduction of the energy consumption and the carbon footprint at European level. The document identifies impact indicators for 2020, amongst which '*% reduction of running & energy costs*'.

One of the audit objectives was to analyse how the current premises are used and based on which analysis (i.e. current energy consumption) was decided what buildings are the most inefficient and should therefore be replaced or up-graded. During the interviews, the audit team learned that two JRC sites measure just the aggregated energy consumption at the site level, whereas another two go down to measure it at the level of the single building. The Strategy Plan uses the actual values of consumption for the year 2010 and a projection of the 2010 figures for 2011.

Petten and Geel are equipped with a building management system which allows precise remote monitoring and control of heating of each building. Ispra and Karlsruhe don't have such system but could provide the main consumption data even if not detailed as in Petten and Geel.

⁴¹ Ref. Ares(2013)2987075 - 04/09/2013 Subject: Staff planning reference for the 2014-16 work programme, Ref: Note Ares (2013)1562020 - 31/05/2013

To provide an input to the Strategic Plan, IRMM has made a study on the identification of alternative energy sources⁴², while acting on reducing losses (i.e. insulation of pipelines in the central heating building). A comprehensive, conclusive energy study for the Geel site is still in a planning phase.

In **Ispira**, the site redeployment planning, done by the C.5 Unit, is mainly based on clustering of activities in a central area of the site. After construction of new buildings, obsolete buildings⁴³ as well as 'abandoned' ones are planned to be demolished. According to the auditees, it would not be cost-efficient to bring this building up to the current environmental requirements. It is striking that no exchange with the unit C.4 'Maintenance and Utilities'⁴⁴ was conducted for defining this exercise. Only recently a horizontal working group C4-C5 has been set up to deal with the improving of the heating and cooling of the new buildings, setting up the first example of formal collaboration.

ISM, during the contradictory process, showed the existence of a measurement energy system for the new buildings.

"In 2013 a technical assessment has been performed in order to identify the energy balance and impact of the new buildings on the site. The conclusion of the assessment stated that the two new buildings should contribute up to 6% in energy saving on the primary source consumption (20-20-20 objectives), subject to specific conditions. It should also be noted that the formal energy certification by an independent and accredited professional is planned and budgeted but will happen during the winter season, for obvious technical reasons. This can only happen in the winter 2014."

ITU documented the existence of a measurement energy system during the contradictory procedure.

"Consumed heating energy is registered daily, consumed electrical energy is registered monthly (but could be also monitored daily if necessary). The WPA report is a summary of the whole year and is used as a tool for management decision making process".

"Heating and electrical energy can be (and is) measured for each wing separately. Moreover, electrical energy in the laboratory wings can be differentiated between technical installations, scientific equipment and light/office equipment. Hence, the energy consumption figures can be differentiated".

Likewise, all the sites affirm that energy saving can be easily achieved in the office building areas, as opposed to the technical and scientific facilities. In this context, **Sevilla** is able to clearly demonstrate the savings to be achieved by moving to more energy efficient premises.

Although a detailed analysis has not been done in this area, it results however that the JRC sites have not conducted in depth analysis of the energy consumption, using instead broad estimations for the justification of the need for renewing the sites. This does not mean that those justifications are not valid whatsoever⁴⁵; nevertheless it means that there is scanty evidence/ data available against which to measure and report on the progress achieved along the implementation of each of the projects. Employing the most recent

⁴² An analysis exploring the possibility to use geothermal energy (in a joint project with the neighbouring Belgian organization VITO), has been stopped by the Director General.

⁴³ This is mostly the case of buildings dating back to the '60s and '70s and having a surface between 500m²-1000m².

⁴⁴ Responsible for the calculation of the running costs.

⁴⁵ Especially in the context of achieving the targets set up by the Strategy 2020

energy efficient technologies in the construction of the infrastructure projects does not guarantee the reduction of the general running costs per site.

Other factors as for instance, the capacity of the new building (i.e. much higher than the previous one), or the type of building chosen (with an intensive use of glass both for external walls and internal partitions) should be well balanced before choosing the design.

On the other hand, if energy consumption metrics cannot be achieved at building/scientific facility level, it will be difficult to increase staff awareness and accountability on the way it acts towards energy savings.

Observation: The energy efficiency of the building projects sampled has been studied under very different methodologies. Besides, even if present a basic metering system in some cases, as Ispra and Karlsruhe, it does not appear that an advanced energy metering equipment has been included in the projects of these two sites to the extent necessary for conducting a close monitoring of the 'real life' energy efficiency', compared to the forecast efficiency.

R.006.I When assessing any new project for infrastructure and buildings, the Site Management Coordinating Committee should verify that in-depth energy efficiency studies have been conducted, in order to ensure that the standards desired by the JRC are actually respected.

Besides efficiency considerations, inspired in the principle of sound financial management, this recommendation is related to a potential reputational risk, since JRC itself is scientifically engaged in the field of energy, and the European Commission has set major energy efficiency goals in its long-term political programmes.

Classification: Important

Type: Efficiency and Effectiveness

Proposed due date: 3M from the date of delivery of the final report

ICS: 8-Processes and Procedures, 9-Management Supervision;

4.6.2 Preparation of individual infrastructure file –general design

In 2007, when the first sites launched the infrastructure projects analyzed in this audit, the JRC had developed significant technical capabilities in its most technical sites as a result of continuous need of handling all its buildings and related infrastructures⁴⁶. However, these competencies were mainly related to maintenance and refurbishment, but not to new construction works.

Ispra and Karlsruhe sites decided to organise architectural contests (according to Art.91 FR and 125 IR) for selecting a general planner to present a proposal suitable to the requirements.

It is to be noted that in Ispra the urban site plan completely renewed and rethought the site vision. According to their choice, some 90% of the staff was to be concentrated into a newly build central 'Science Zone' area, representing only 10% of the site. The aim of such a concentration was 'to reduce fragmentation and dispersion of units over the site, while increasing scientific efficiency by facilitating multidisciplinary research and reduce operational costs'⁴⁷. This involved a completely new concept design for a large scale project, with multiple buildings (the Science Zone itself is designed to include four main buildings), combining office and research facilities.

In Karlsruhe, the original project had a much more reduced scope, as it referred to the provision of office space outside the controlled area for the scientific staff. As already remarked in section 4.4, the ITU did not analyze in-depth feasible alternative to the solution chosen.

Both sites of Ispra and Karlsruhe, which chose for a sophisticated, costly and time consuming procedure, have encountered a significant number of weaknesses in the initial design. On the contrary, this has not happened in Geel (and although the size of IRMM office building is much smaller than those from Ispra and Karlsruhe), it shows that a simpler approach (call for tender for the design and supervision services).

⁴⁶ 'Four JRC sites host 31 large-scale experimental research facilities, ranging from installations for producing reference materials for the food and feed chain; test facilities for vehicle emissions, fuel cells and photovoltaic devices, electron accelerators, hot cells and other facilities to investigate safety aspects at the nuclear fuel cycle, atmosphere-biosphere-climate measuring station, vulnerability tests of buildings and civil structures including earthquake resistance, etc'. Draft Budget 2012 Working Document on the JRC building policy.

⁴⁷ JRC Strategic Infrastructure Development Plan, chapter 4.2. Ispra

4.6.3 Comparison of performance indicators

Table 12: performance indicators comparison

210- IRMM-GEEL			
offices m ²	980	office m ² per staff member	13.07
circulation area m ²	730	% circulation area in total built area	33.1%
total area to be constructed m ²	2203	Total built m ² per staff member	29.37
Actual cost of the building	€ 4,586,074.00	Price/m ² (built)	€ 2,082.12
Number of staff to be accommodated	75		
Archives +meeting conference m ²	391		

NCO - ITU-KARLSRUHE			
offices m ²	3735	office m ² per staff member	12.04
circulation area m ²	2330	% circulation area in total built area	29.6%
total area to be constructed m ²	7880	Total built m ² per staff member	25.41
Actual cost of the building	€ 18,808,425.68	Price/m ² (built)	€ 2,386.85
Number of staff to be accommodated	310		
Archives +meeting conference m ²	1327		

100 - IES-ISPRA			
offices m ²	2480	office m ² per staff member	11.27
circulation area m ²	3915	% circulation area in total built area	33.8%
total area to be constructed m ²	11580	Total built m ² per staff member	52.64
Actual cost of the building ⁴⁸	€ 19,873,000.00	Price/m ² (built)	€ 1,716.15
Number of staff to be accommodated	220		
Archives +meeting conference m ²	635		

101- IHCP-ISPRA			
offices m ²	2650	office m ² per staff member	12.33
circulation area m ²	3695	% circulation area in total built area	31.9%
total area to be constructed m ²	11580	Total built m ² per staff member	53.86
Actual cost of the building ⁴⁸	€ 19,873,000.00	Price/m ² (built)	€ 1,716.15
Number of staff to be accommodated	215		
Archives +meeting conference m ²	805		

⁴⁸ For the two Ispra buildings, was taken in consideration the actual total invoiced amount of € 39,747,137.07, although the estimated final cost is € 44,272,004.07

Table 13: Office Furniture Costs comparison

Site	Office furniture cost		Staff (approximate)	Furniture cost per employee
IRMM Geel	€ 60,000.00	Not Dromeas FWContract	75	€ 800.00
IES-IHCP Ispra	€ 906,161.00	Dromeas FWC - Out of the procédure immobilière and paid by extra budget	450	€ 2,013.69
ITU Karlsruhe	€ 837,256.00	Dromeas FWC	300	€ 2,790.85

Table 14: Consultancy Costs comparison

Site	engineering/ architect fees	% on the amount of the project
IRMM Geel	€ 258,327.00	4.7%
IES-IHCP Ispra	€ 3,036,000.00	6.8%
ITU Karlsruhe	€ 1,460,671.00	7.8%

4.6.4 *Lack of a local/corporate procedure and appropriate back-up to ensure completeness of the project*

The important modifications brought to the work contracts in two major sites: Ispra and Karlsruhe reflect significant weaknesses in the planning and development of the design phase.

In the case of Karlsruhe, the project has shown that the ITU's technical staff involved in the supervision relied greatly on the external contactors; some weaknesses in the initial planning could have been detected already at that stage.

Moreover, part of the lacks could not be explained due to insufficient documentation of the file (i.e. Amendment no. 3) and the sudden decease of the previous ITU technical supervisor.

4.6.5 *Risks related to sensitive posts*

Last but not least the audit fieldwork has found that quite often the same group of staff has been engaged in the management of these projects, since their earliest steps, covering the corresponding financial and technical positions.

This human resources policy certainly takes into account the experience of such staff, and it is conditioned by the constraints of mobility within relatively small working environments, but it can create a lack of independency. As a consequence, this could enter in conflict with higher-priority fraud prevention and internal control policies.

This general consideration becomes even more significant at the light of the big amounts engaged, and the new planned projects for strategic investments.

On 28/06/2013, Directorate B has approved a new procedure for the "Identification and Management of Sensitive functions". The audit team fully appreciates the initiative. As a matter of fact, an audit in the field is already included in the 2014 work programme in order to verify our continuous compliance with the standards.

5. CONCLUSION

This audit report includes 6 recommendations, which are classified as follows:

- No critical recommendation;
- 4 (four) very important recommendations;
- 2 (two) important recommendations;
- No desirable recommendations.

Audit opinion: Unsatisfactory

Based on the results of our audit, as described in the objectives and scope of the audit engagement, we believe that the internal control and governance process in place does not provide reasonable assurance regarding the achievement of the business objectives set up for the activities audited.

Having said this, we consider that the JRC could significantly improve the development process of any new building, as well as their alignment with the long-term scientific priorities, if the recommendations summed-up below are adopted.

Very important recommendations addressed at senior management level:

The JRC Strategic Development Plan 2012-2020 and the Short Term Development Plan have to be formally up-dated and approved by the JRC's Director General.

The JRC Strategic Infrastructure Development Plan 2012-2020 constitutes the guiding document for the implementation of the JRC's infrastructure policy. In order to be recognized and efficiently implemented it needs formal approval from the senior management.

The JRC's Director General should mandate a senior corporate scientific role to overview the continuous alignment of any scientific infrastructure projects with the JRC's scientific strategic goals.

The governance structure in place for the scientific infrastructure investments does not include a scientific oversight role at the corporate level. Accordingly, the alignment of the infrastructure proposals across the organization to the scientific future priorities of the JRC is not guaranteed.

The preceding recommendation would be classified critical, but as there were steps taken by the Director General in order to reinforce supervision before further infrastructure projects are initiated, it was considered as "very important". In lack of durable measures, the associated risk has a potential to become critical again.

The Director General, after having listened to the Directoire, will approve any contract or order of technical services, passing an established threshold, which has the specific goal to develop JRC-owned infrastructures.

It is the responsibility of the Authorizing Officers by Subdelegation to provide due and timely justification on the building projects proposal and secure the hierarchical support before engaging any financial resources into the project.

When assessing any new project for infrastructure and buildings, the Site Management Coordinating Committee must consider, at the planning stage, the need to keep the corresponding project accounting under sufficient control all over the development of the project, taking in consideration the constraints imposed by the JRC accounting systems. The developing of a valid tool for the cost-accountancy of the project should be considered.

The plurality of contracts, combined with their inefficient management, covering the 'two-building' project in Ispra and with the lack of an efficient tool of cost accounting, has not allowed an adequate traceability of costs during the audit.

Important recommendations addressed at senior management level:

The JRC Site Management Coordinating Committee (or a relevant corporate body) will make compulsory to include a life-cycle cost assessment in every infrastructure proposal submitted for evaluation. The life-cycle cost assessment will consider all costs necessary for design, construction, maintenance, operation and decommissioning of the concerned infrastructure over its whole intended useful life.

The Institutes did not use the building life-cycle cost in the selection process amongst different alternatives.

A fair estimation of the total construction cost is also important for choosing the most efficient and cost-effective project.

When assessing any new project for infrastructure and buildings, the Site Management Coordinating Committee should verify that in-depth energy efficiency studies have been conducted, in order to ensure that the standards desired by the JRC are actually respected.

Besides efficiency considerations, inspired in the principle of sound financial management, this recommendation is related to a potential reputational risk, since JRC itself is scientifically engaged in the field of energy, and the European Commission has set major energy efficiency goals in its long-term political programmes.

6. ANNEXES

6.1 Annex 1: Table of Recommendations

NUMBER & CLASSIFICATION ⁴⁹	RECOMMENDATION	TYPE ⁵⁰	PROPOSED DUE DATE ⁵¹	ICS	RESPONSIBLE FOR IMPLEMENTATION ⁵²
R.001.VI	<p>The JRC Strategic Development Plan 2012-2020 and the Short Term Development Plan have to be formally up-dated and approved by the JRC's Director General.</p> <p>The JRC Strategic Infrastructure Development Plan 2012-2020 constitutes the guiding document for the implementation of the JRC's infrastructure policy. In order to be recognized and efficiently implemented it needs formal approval from the senior management.</p> <p>If the JRC senior management deems not feasible to commit to the long-term plan implementation due to its duration and budgetary implications, the short term plan should be formally endorsed and constitute the authority in the field. The Strategic Plan should be regularly up-dated and used as a guiding document for feeding the short term plan. Both must be aligned, updated and formally approved</p>	EE	3M	08-09	DG

⁴⁹

Classification: can be graded CRITICAL (C), VERY IMPORTANT (VI), IMPORTANT (I) or DESIRABLE (D).

⁵⁰ Type: indicates whether the recommendation concerns a COMPLIANCE (CM) issue, or an EFFICIENCY & EFFECTIVENESS (EE) issue.

⁵¹ Proposed Due Date: is the delay relative to the date of delivery of the final report (3, 6, 12 or 18 months) which the Action Plan should take into account for establishing the target dates for single actions.

⁵² Responsible for Implementation: is the organisme role(s) or coordinating structure/network which is responsible for the recommendation's implementation.

<p>R.002.VI</p>	<p>The JRC's Director General should mandate a senior corporate scientific role to overview the continuous alignment of any scientific infrastructure projects with the JRC's scientific strategic goals.</p> <p>The governance structure in place for the scientific infrastructure investments does not include a scientific oversight role at the corporate level. Accordingly, the alignment of the infrastructure proposals across the organization to the scientific future priorities of the JRC is not guaranteed.</p> <p>The overarching role could report directly to the Directorate. Directorate A Units coordinating the Work Programme (for nuclear and non-nuclear research) could support this role.</p> <p>Such alignment review should certainly take into consideration basic budgetary magnitudes, like credits available for research, ensuring there is a reasonable proportion between infrastructure investment and work to be conducted at the facilities, according to the principle of sound financial management (Financial Regulation, Art. 27).</p> <p>The preceding recommendation would be classified CRITICAL in standard circumstances, since as specific steps have been taken by the Director General in order to reinforce supervision before further infrastructure projects are initiated, it is downgraded to VERY IMPORTANT.</p> <p>The IAU is convinced that in the absence of appropriate, stable measures, the associated risk has a potential to become actually "critical".</p>	<p>EE</p>	<p>3M</p>	<p>08-09</p>	<p>DG with support of Directorate A</p>
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<p>R.003.VI</p>	<p>The Director General, after having listened to the Directoire, will approve any contract or order of technical services, passing an established threshold, which has the specific goal to develop JRC-owned infrastructures.</p> <p>It is the responsibility of the Authorizing Officers by Subdelegation to provide due and timely justification on the building projects proposal and secure the hierarchical support before engaging any financial resources into the project.</p> <p>The corresponding technical services should cover all the life-cycle of the project, from preliminary studies to definitive executive projects.</p> <p>A single approval of the Director General can be understood as covering different contracts or orders of technical services regarding the same infrastructure project, provided that the goal and comprehensive budget are made explicit in the note of approval.</p>	<p>EE</p>	<p>3M</p>	<p>08-09</p>	<p>DG</p>
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<p>R.004.I</p>	<p>The JRC Site Management Coordinating Committee (or a relevant corporate body) will make compulsory to include a life-cycle cost assessment in every infrastructure proposal submitted for evaluation. The life-cycle cost assessment will consider all costs necessary for design, construction, maintenance, operation and decommissioning of the concerned infrastructure over its whole intended useful life.</p> <p>IRMM, as all the Institutes, did not use the building life-cycle cost in the selection process amongst different alternatives.</p> <p>A fair estimation of the total construction cost is also important for choosing the most efficient and cost-effective project.</p> <p>[Note: although this observation took physically place at the IRMM, according to the analysis of the audit team is applicable to all future projects of infrastructure, no matter where they will be located].</p> <p>The life-cycle cost assessment submitted will state explicitly the method used, including the estimated useful life used for the analysis. As experience is progressively built, the JRC Site Management Coordinating Committee will steer a reasonable homogenization of all life-cycle cost assessments submitted.</p>	<p>EE</p>	<p>3M</p>	<p>08-09</p>	<p>Directors C, D, E, F and J with the support of JRC Site Management Coordinating Committee</p>
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<p>R.005.VI</p>	<p>When assessing any new project for infrastructure and buildings, the Site Management Coordinating Committee must consider, at the planning stage, the need to keep the corresponding project accounting under sufficient control all over the development of the project, taking in consideration the constraints imposed by the JRC accounting systems. The developing of a valid tool for the cost-accountancy of the project should be considered.</p> <p>The plurality of contracts, combined with their inefficient management, covering the 'two-building' project in Ispra and with the lack of an efficient tool of cost accounting, has not allowed an adequate traceability of costs during the audit.</p> <p>The Site Management Unit (or equivalent) presenting the project will address this issue in a specific, separate section of the project file. The SMCC will ask for an opinion of Unit B.4 and B.5, when necessary, and will aim to standardise the cost-accounting practices for different projects. Special attention will be paid to avoiding overlaps on the same project of different contracts awarded to the same contractor, whenever they exist.</p> <p>Along the evolution of the project, the SMCC will report to the Directoire about the evolution of the actual cost of the project, and of the estimate of the cost for completion, following the established cost-accounting plan.</p>	<p>EE</p>	<p>3M</p>	<p>08-09</p>	<p>SMCC (or relevant corporate body)+ Site Management Units C.5, D.1, E.1, F.1 and B.11, with support of Unit B.4 and B.5</p>
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<p>R.006.1</p>	<p>When assessing any new project for infrastructure and buildings, the Site Management Coordinating Committee should verify that in-depth energy efficiency studies have been conducted, in order to ensure that the standards desired by the JRC are actually respected.</p> <p>Besides efficiency considerations, inspired in the principle of sound financial management, this recommendation is related to a potential reputational risk, since JRC itself is scientifically engaged in the field of energy, and the European Commission has set major energy efficiency goals in its long-term political programmes.</p> <p>The energy efficiency of the building projects sampled has been studied under very different methodologies. Besides, even if present a basic metering system in some cases, as Ispra and Karlsruhe, it does not appear that an advanced energy metering equipment has been included in the projects of these two sites to the extent necessary for conducting a close monitoring of the 'real life' energy efficiency ', compared to the forecast efficiency.</p>	<p>EE</p>	<p>3M</p>	<p>08-09</p>	<p>Directors C, D, E, F and J with the support of JRC Site Management Coordinating Committee</p>
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TABLE OF RECOMMENDATIONS

NUMBER & CLASSIFICATION ⁵³	RECOMMENDATION	TYPE ⁵⁴	PROPOSED DUE DATE ⁵⁵	ICS	RESPONSIBLE FOR IMPLEMENTATION ⁵⁶
R.001.VI	The "JRC Strategic Development Plan 2012-2020" and the "Short Term Development Plan" have to be formally up-dated and approved by the JRC's Director General.	EE	3M	08-09	DG
R.002.VI	The JRC's Director General should mandate a senior corporate scientific role to overview the continuous alignment of any scientific infrastructure projects with the JRC's scientific strategic goals.	EE	3M	08-09	DG with support of Directorate A
R.003.VI	The Director General, after having listened to the Directoire, will approve any contract or order of technical services, passing an established threshold, which has the specific goal to develop JRC-owned infrastructures.	EE	3M	08-09	DG
R.004.I	The JRC Site Management Coordinating Committee (or a relevant corporate body) will make compulsory to include a life-cycle cost assessment in every infrastructure proposal submitted for evaluation. The life-cycle cost assessment will consider all costs necessary for design, construction, maintenance, operation and decommissioning of the concerned infrastructure over its whole intended useful life.	EE	3M	08-09	Directors C, D, E, F and J with the support of JRC Site Management Coordinating Committee
R.005.VI	When assessing any new project for infrastructure and buildings, the Site Management Coordinating Committee must consider, at the planning stage, the need to keep the corresponding project accounting under sufficient control all over the development of the project, taking in consideration the constraints imposed by the JRC accounting systems. The developing of a valid tool for the cost-accountancy of the project should be considered.	EE	3M	08-09	SMCC(or relevant corporate body); Site Management Units C.5, D.1, E.1, F.1 and B.11, with support of Unit B.4 and B.5
R.006.I	When assessing any new project for infrastructure and buildings, the Site Management Coordinating Committee should verify that in-depth energy efficiency studies have been conducted, in order to ensure that the standards desired by the JRC are actually respected.	EE	3M	08-09	Directors C, D, E, F and J with the support of JRC Site Management Coordinating Committee

Classification: can be graded CRITICAL (C), VERY IMPORTANT (VI), IMPORTANT (I) or DESIRABLE (D).

Type: indicates whether the recommendation concerns a COMPLIANCE (CM) issue, or an EFFICIENCY & EFFECTIVENESS (EE) issue.

Proposed Due Date: is the delay relative to the date of delivery of the final report (3, 6, 12 or 18 months) which the Action Plan should take into account for establishing the target dates for single actions.

Responsible for Implementation: is the organogram role(s) or coordinating structure/network which is responsible for the recommendation's implementation.

