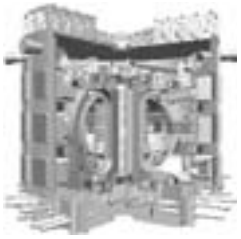

ITER ITA NEWSLETTER

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JASS PROCESS SUCCESSFULLY COMPLETED

by Dr. P. Barabaschi, ITER International Team

During the Eighth ITER Negotiations Meeting (N8), which took place in St. Petersburg on 18 – 19 February 2003, the Negotiators "…noted the completion of the Joint Assessment of Specific Sites (JASS) and the approval of the final JASS Report by the four Participants that commissioned and undertook the study."

The JASS process was initiated in the framework of Negotiations for the Participants to jointly undertake the assessment of the four candidate ITER sites. The Negotiators Standing Sub Group (NSSG) took this charge from the Negotiators and subsequently set up an appropriately selected ad hoc group that could cover the agreed criteria subjects. These would range from purely technical aspects, specifically the Site Requirements and Assumptions agreed during the EDA, to socio-economic, licensing, and financial aspects. The ad hoc group was formed of ~ 4 members from each Participant, together with the complement of 3 members from the International Team.

The core part of the process consisted in four distinct site assessments during the period between 12 September and 14 December 2002. Each of the meetings lasted four intense days, when the group took note of the various presentations by the proponents' teams in the fields applicable to the JASS, visited the proposed site locations as well as the neighbouring communities, and jointly drafted four findings reports on the basis of full consensus. These four reports subsequently became the basis of the final JASS report submitted to the NSSG in January 2003 and agreed after a final meeting of the four meetings' Chairmen. The NSSG delegations subsequently "…adopted the JASS Final Report, including its four attached sites Findings Reports for submission to N8."

The JASS summary final report is printed on the following pages and may be found in its entirety, including the four attached findings, at http://www.iter.org/jass.

ITER Candidate Sites

Introduction & Summary

During the period between the 12th September 2002 and 14th December 2002, four distinct Joint Assessment of Specific Sites (JASS) meetings have taken place at the four proposed ITER Sites:

- Clarington, Canada, 12-15 September 2002
- Rokkasho, Japan, 2-5 October 2002
- Cadarache, EU, 3-6 December 2002
- Vandellos, EU, 11-14 December 2002

This task was carried out in accordance with the provisions set out by the ITER Negotiators[1] and resulted in the preparation of four respective "Findings Reports" (Attachments 1 to 4), as well as this Final Report that summarises such findings in the consolidated view of the four respective Chairmen.

The JASS process was carried out on the basis of detailed input documents based in turn on in depth studies performed by the proponents. JASS ad-hoc group members were offered the opportunity to tour the surroundings of the proposed sites and meet representatives of the local authorities.

As a main conclusion and despite the differences between the candidate Sites, the JASS assessment ascertained that all four Sites are sound and fully capable to respond to all ITER Site Requirements and Design Assumptions, as approved by the ITER Council in its January 2000 Meeting.

As a result of the assessment process, the JASS Ad-Hoc group has concluded that ITER may be successfully implemented at any of the candidate Sites. Some differences amongst Sites do however exist. The assessment of some issues led to the identification of appropriate mitigation measures to be put in place by the respective Hosts.

Hosting ITER is strongly supported by all proponents' Authorities also on the basis of their acquaintance with nuclear technology. In fact, all Sites are in close proximity to other nuclear facilities, either for research, power production or reprocessing purposes – ITER could benefit from these existing infrastructures for a variety of support services. Well defined licensing and decommissioning processes were ascertained for all the Sites.

All proponents will make the land available free of charge for the time required without any constraints on its use. All Sites have adequate land available for construction as well as excellent soil properties. Seismicity being one of the main design assumptions, led three of the proponents, where records of seismic activities exist, to undertake detailed studies. One of the Sites benefits from absence of seismic activity. Meteorology also required detailed examination as temperature, precipitation and wind velocity impact on heat sink capabilities and building design – also some potential savings have been identified as a consequence. In all Sites the general requirements for water and electrical power supplies were addressed in great detail and, with appropriate site adaptations, satisfied in full. Three of the Sites can be directly reached through major waterways. All candidate Sites have access to the required industrial workforce.

The Sites have access to differing socio-economic infrastructures and are all located 40-60 km from cities, one of which is a major cosmopolitan area. Needs were identified to a) define criteria for the use of English as a working language and b) set up adequate and efficient facilities to welcome staff coming from abroad and help their rapid insertion into the surrounding communities.

The mitigation to make Sites suitable to receive the ITER installation varies from Site to Site, mainly related to transportation, site preparations, and electricity supply. In the case of Vandellos, Cadarache and Rokkasho-mura the implementation of these mitigations will be the responsibility of the Host. In the Canadian case, until now, no explicit financial commitment from the Federal government has been presented [2].

Operation, decommissioning, and socio-economic related costs vary from Site to Site. The data obtained during JASS will be used for the development of the Scenarios in the Negotiating process.

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[1] The provisions on JASS Organization, point 5 of the Progress Report on JASS, N5 Record of Meeting, Attachment 9, and the provisions set out in NSSG-5 Progress Report to N6 and included in N6 Record of Meeting, Attachment 5.

Clarington - Canada

Canada's proposed Site for ITER is located in Clarington, on the shore of Lake Ontario about 60 km east of Toronto, and adjacent to an operating nuclear generating station (Darlington). The Site is currently licensed for nuclear use as it was previously designated for a second nuclear generating plant, no longer being considered. The lakeshore portion of the property will be dedicated to the ITER facilities. It is large enough to provide for flexibility during construction as well as space for future expansions of the facilities.

Simple site layout, excellent geo-technical characteristics and the absence of seismic activity are among the major strengths of Clarington. Also, the Site is adjacent to a cement plant whose docking facility, now undergoing an extension, will be connected to the Site by a heavy-haul road to allow for easy transfer of material onto the ITER Site. Ocean-going ships will be able to access the dock 9 months a year. An existing rail spur is available to handle rail-shipped equipment. The proposed Site is adjacent to a major 500 KV node of the Ontario electrical transmission grid, supported by 30,000+ MW of installed generating capacity.

Tritium is produced as a by-product in CANDU reactors and separated and stored at the Tritium Removal Facility on the adjacent Darlington Site where it will be available to ITER in sufficient quantities for its needs over its planned life cycle. As a consequence, tritium can be favourably transported to the ITER Site without crossing any public access property.

Canada does not at present have a coordinated national fusion R&D program, although there are individuals and corporations that were involved in the ITER EDA.

The local community is adjacent to the Greater Toronto Area (GTA), which is the sixth largest metropolitan area in North America with all the cultural and life-style advantages of a large community, served by extensive transportation systems. The GTA's Pearson airport is an international air transportation centre with direct flights available to all major cities in the world, and served by many international airlines. The socio-economic and multi-cultural environmental conditions in the Greater Toronto area will facilitate the insertion of people coming from overseas and therefore no specific plans were given regarding the establishment of an international school.

As to licensing ITER in Canada, an organisation called the ITER Institute has been incorporated and has started the formal procedure.

Due to its specific financing model, the Canadian offer required clarifications concerning the cost impact of several infrastructure components and the site preparations, costs which are normally deemed to be borne by the Host, but which might eventually be borne by the ITER Parties during the exploitation phase under the proponents' financial scheme [2].

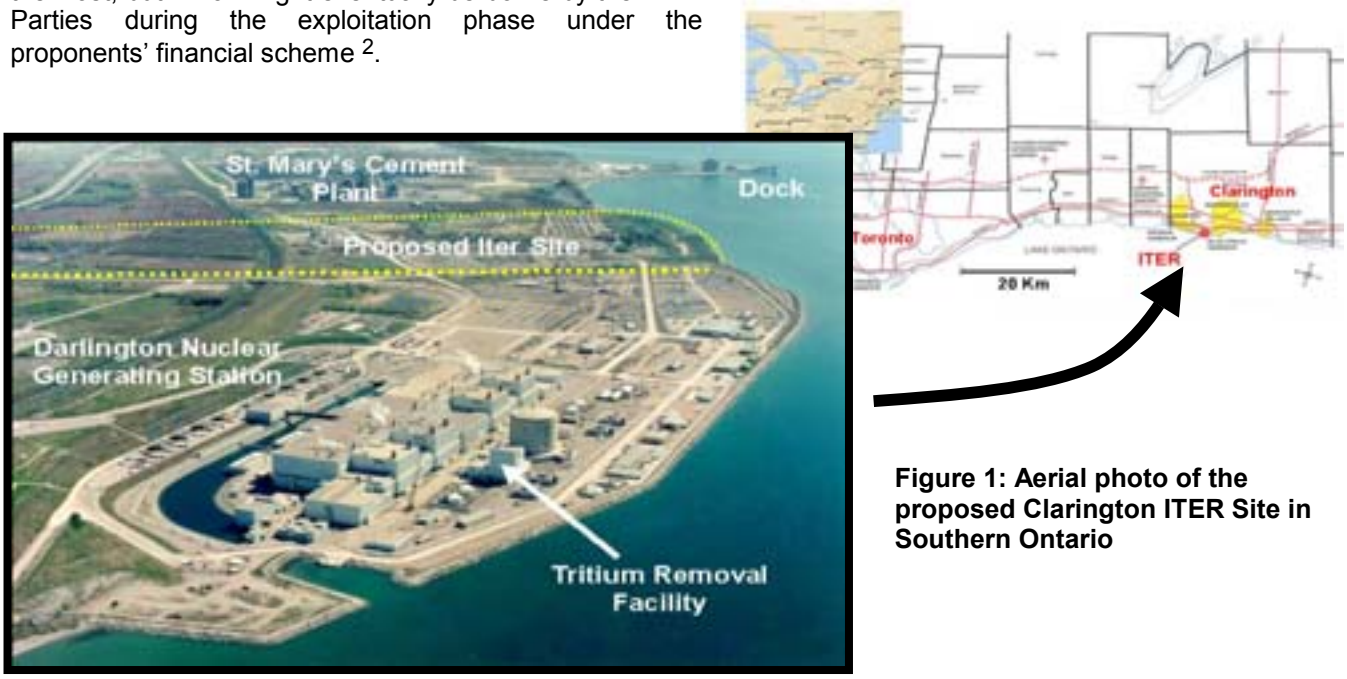

Figure 1: Aerial photo of the proposed Clarington ITER Site in Southern Ontario

2 The Canadian Delegation announced to the N-7 meeting that the Government of Canada was reviewing its offer in concert with the Government of Ontario and with Iter Canada and its member organisations. The Canadian Negotiators anticipated a revised offer by the end of March 2003, allowing the overall workplan and milestones of the Negotiations to be maintained.

Rokkasho - Japan

Japan's proposed Site for ITER is situated in Rokkasho, Aomori prefecture, in the northern part of the Honshu island. Rokkasho is about 45min drive north of Misawa city and is located next to the newly built Nuclear Fuel Cycle Facility and close to the seashore. A large dock already exists and is connected to the Site via an existing public road.

Excellent topography, geo-technical characteristics and flexibility in the choice of heat rejection method are among the strengths of the Site. However, whilst the seismic characteristics of the Site are still under detailed evaluation, the use of seismic isolation rubber bearings for the Tokamak building may be required to increase margins. The weather conditions are generally within the design assumptions, however heavy winter snowfall will require some small structural changes to the buildings.

The proposed Site is reasonably close (30km) to a 500kV substation and a dedicated double-circuit 275 kV power transmission line will be built for ITER. Flywheel generators may be required as a mitigation measure. Whilst this system will provide a flexible and secure supply, somewhat larger operational costs will ensue. Electricity unit cost provided to JASS during the assessment is relatively higher. Its impact on the operational costs will be further assessed in the Negotiation process together with other consumable and service costs.

Japan will be able to support the project through its significant domestic fusion programme, on going in several Universities as well as JAERI.

The socio-economic and cultural environmental conditions in the Rokkasho-mura area can be summarised as follows. Overseas access to or from Rokkasho-mura requires transfer at Tokyo, possibly requiring an overnight stay. As to education, the Japanese education system would be open to the children of ITER staff, but a working knowledge of Japanese is necessary. Thus the Aomori Prefecture, under consultation with the government, has outlined a proposal for the establishment of an international school, offering English language-based education up to senior high school level. The region offers a safe and secure living environment with lifestyle options primarily oriented towards outdoor activities. To offset the limited availability of housing options, the Aomori Prefecture has outlined the proposal for alternative housing developments. Whilst below Japanese average, the cost of living is expected to be relatively high.

As to licensing ITER in Japan, MEXT is considering development of specific nuclear safety legislation and regulations, to be available by the end of 2003. In particular a code case for ITER structural design is being considered by JSME and ASME. The dismantling strategy envisaged in Japan is that radioactive waste from ITER will be processed and disposed as low-level radioactive waste. The Aomori Prefecture has agreed to the buried disposal of radioactive materials inside the prefecture district, likely in the adjacent waste disposal facility.

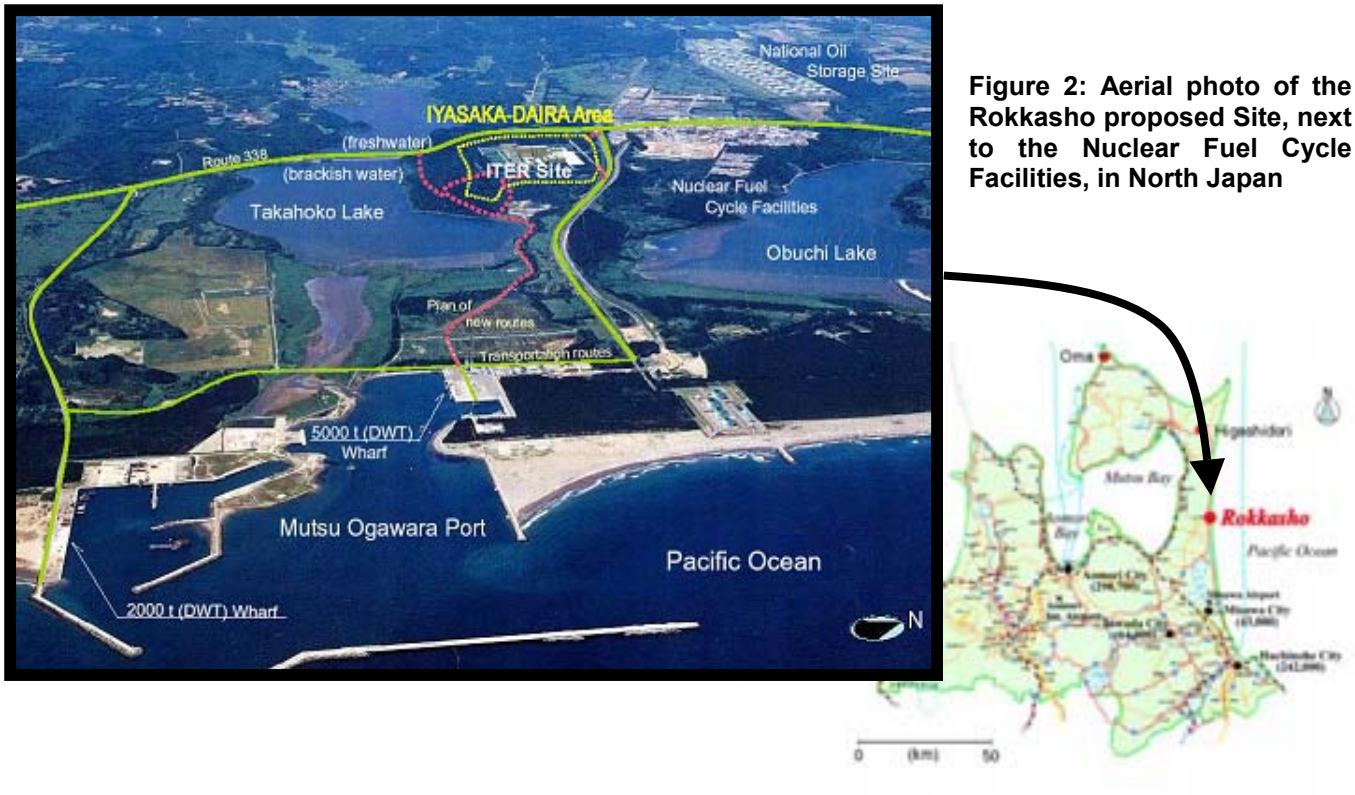

Figure 2: Aerial photo of the Rokkasho proposed Site, next to the Nuclear Fuel Cycle Facilities, in North Japan

Cadarache – EU

The Cadarache proposed Site for ITER is situated 40 km north of the city of Aix-en-Provence in the Provence-Alpes-Côte d'Azur (PACA) region of France. Construction and operation of ITER could be supported by the adjacent centre of CEA/Cadarache, which is one of the major nuclear research areas in France with 18 nuclear installations.

The proposed Site is suitable for the generic layout and fulfils all geo-technical ITER requirements. The seismic characteristics of the Site have been studied in detail and found similar to the generic design assumptions. The weather conditions are favourable and will permit the use of cooling towers about 20% smaller than in the generic design.

Cadarache is located at a road distance of ~100 km from a to-be-constructed roll-on/roll-off dock. A reference transportation route has been identified from there to the Site. A detailed study has been performed for the implementation of all necessary road modifications and upgrades to show that transportation by road of the ITER heavy components would be viable; no significant technical difficulty has been identified. The French authorities are committed to provide such modifications if ITER is sited at Cadarache. It will not be possible to receive the largest PF coils (PF 2-5) and their on-site construction will be mandatory.

There is in Europe a proven industrial capability in all areas of the project and a broad-spectrum capability at the regional level for the relevant high-tech services and workforce. Within the European Fusion Programme, the Euratom-CEA Association has a broad base of activity, centred around the Tore Supra superconducting tokamak for physics in the nearby CEA Cadarache Centre and also on fusion technology. CEA is able to offer a large choice of services based on CEA know-how and trained personnel. The Cadarache Centre support facilities will be available right from the beginning of the construction phase.

The PACA region is well known for the variety of lifestyle options. It has a temperate climate and offers an atmosphere of safety and security in the towns and rural areas in the region around Cadarache. The cost of living is above the European average but increasing at a slower rate. French Authorities offered a number of schooling options, including the option to appeal for the establishment of a "European School" that could include non-European languages sections.

The licensing of a nuclear installation in France follows standard practice and no new specific administrative procedures or regulations will have to be developed. If mandated by the Parties, CEA could apply and receive authorisation pending the establishment of the Organisation, and then transfer the authorisation back to the Organisation. There are well established regulations concerning the transportation and storage of nuclear waste.

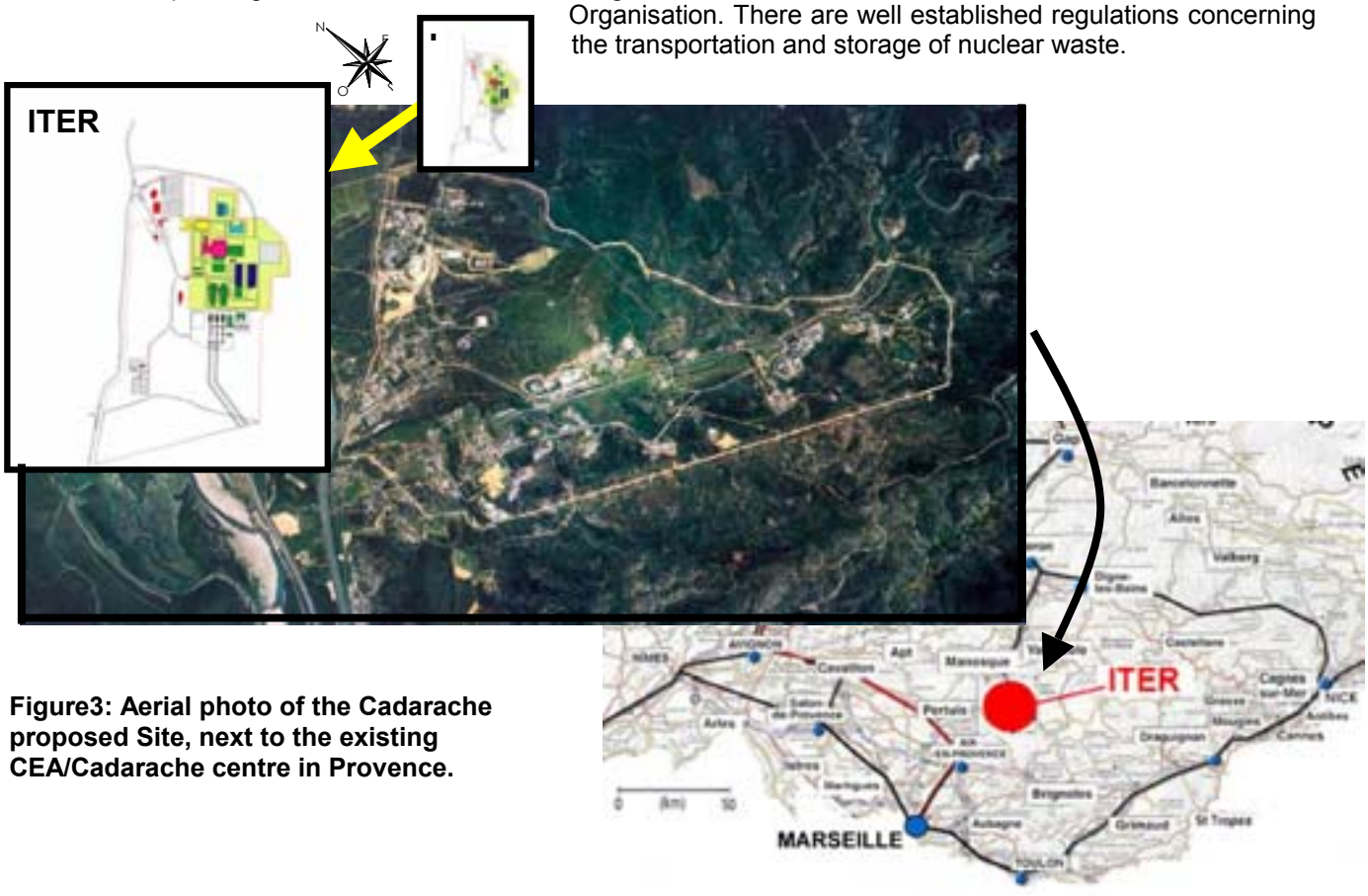

Figure3: Aerial photo of the Cadarache proposed Site, next to the existing CEA/Cadarache centre in Provence.

Vandellos - EU

The proposed Vandellos Site is located ~ 46 km (~ 30 min. drive) south of Tarragona and ~134 km (~75 min. drive) from Barcelona where broad access to international travel can be gained. The Site is adjacent to the two existing Vandellos Nuclear Power Plants (NPP), one of them currently being dismantled.

The proposed Site is suitable for the generic lay-out and fulfils all geo-technical requirements. The Barcelona-Valencia railway line divides and somewhat constrains the Site into two plots measuring approximately 49 ha and 21 ha (in total 70 ha). The Site proponent also offered the availability of 2 additional parcels of land for construction lay-down, if required, each about 25 ha, one north, the other south, both located 2-3 km from the Site. The seismic characteristics of the Site have been studied in detail and found similar to the generic design assumptions with no structural adaptations required. The weather conditions are particularly favourable. Seawater cooling is the preferred option for the heat sink at this Site.

The neighbouring 400 kV substation, located at 2 km distance of the Site, is an important node on the Spanish power grid. Two 400 kV, 600 MVA lines, formerly connecting the Vandellos I NPP to the 400 kV substation, will be used to provide a secure supply for ITER.

The coastal situation of the proposed ITER Site and the presence of a dedicated roll-on/roll-off dock by the Vandellos II NPP are amongst the strengths of this Site. The dock is connected to the Site through a private road (~2km long) that has already been utilized to unload heavy components (up to 450 t) and that has enough capability for the transport of the heaviest components with some modifications. The proposed Site allows the possibility to transport the largest PF coils with some additional modifications to the dock and road.

There is in Europe a proven industrial capability in all areas of the project and a broad-spectrum capability at the regional level for the relevant high tech services and workforce. Within the European Fusion Programme, the Euratom-CIEMAT Association is an active member, whose research activities are primarily oriented towards the Stellarator in its Madrid premises. Support from nearby existing facilities will mainly rely on the availability of offices and on the Ascó-Vandellos Nuclear Association emergency services in the nearby Vandellos II NPP.

The Catalonia region is well known for the variety of lifestyle options it offers. It has a mild climate and provides a safe and secure environment for families. There are a variety of cultural attractions throughout the Catalonia region. The cost of living is below the European average but increasing at a faster rate. There are currently international schools in Barcelona, and an additional one for ITER is promised in Tarragona, including capabilities for non-Europeans.

There's a well developed process for licensing in Spain, and the regulatory body has much experience in licensing facilities designed in accordance with standards of different countries. CIEMAT could initiate the licensing procedure, pending the establishment of the Organisation, however the licence can only be granted to the Organisation. There are well-established regulations concerning the transportation and storage of nuclear waste.

Figure 4: Aerial photo of the Vandellos proposed Site on the Spanish Mediterranean coast

Items to be considered for inclusion in the ITER CTA Newsletter should be submitted to B. Kuvshinnikov, ITER Office, IAEA, Wagramer Strasse 5, P.O. Box 100, A-1400 Vienna, Austria, or Facsimile: +43 1 2633832, or e-mail: c.basaldella@iaea.org (phone +43 1 260026392).

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