SECTION 10: ITER CANADA PLAN TO HOST ITER

COMPLIANCE WITH THE ITER SITE REQUIREMENTS AND SITE DESIGN ASSUMPTIONS

10.1 INTRODUCTION

The basis for analyzing the suitability of the Clarington site and the Iter Canada technical Plan, especially compared with other offers or potential offers, is the Iter Council approved document - **"ITER FEAT – Site Requirements and Site Design Assumptions", ITER Meeting, Tokyo, January 2000**. These criteria were also published as ITER FEAT ODR I.1.4 and N CL RI 3 99-10-19 W 0.2). These same criteria are also reproduced verbatim in Section 4 of the Plant Design Specification (PDS) of the draft ITER Final Design Report.

Iter Canada agrees with these criteria and assumptions as defined and agreed to by the Iter Parties. These criteria formed the basis of Iter Canada's own site selection process and they proved to be technically, socially and politically sound. We, therefore, believe they can also be a sound basis for conducting a rigorous and fair site selection process between all the offered Iter sites. In nearly all cases, the conditions at the Clarington site are more favourable to construction and operation of Iter, than defined in the Iter site requirements and assumptions.

The following is a summary analysis of how the Iter Canada Plan meets or accommodates each of the Site Requirements and how the Iter Canada Plan addresses all of the Site Design Assumptions.

For convenience, the Iter Parties' criteria are shown in ***Bold Italics***, and references are made to other Sections of the Plan, where the specifics of the item are described more fully.

10.2 SITE REQUIREMENTS COMPARISON

II Site Requirements

A. Land

II.A.1. Land Area and term of dedicated use

Requirement: ***The ITER site shall be up to 40 hectares in area enclosed within a perimeter. All structures and improvements within the perimeter are responsibility of the ITER project. Land within the perimeter must be committed to ITER use for a period of at least 30 years.***

As described fully in Section 5, the total land area dedicated to the Clarington site and to be owned and under control of the Iter Legal Entity is 184.1 hectares. This land is bordered by Lake Ontario on the south, the Darlington Nuclear Generating Station on the west, the Cartier-MacDonald Freeway (Route 401) on the north, and industrial use land (Blue Circle Cement Company) on the east. This land area is divided into two approximately equal parts by an easement for the Canadian National Railway. The southern portion, 95.2 Ha, between the CN rail line and Lake Ontario, will be used for Iter and all related site development, with the exception of the Laboratory Office Building which Iter Canada believes is more suitably situation at the northern boundary of the site near the entrance to the property (see Attachment 5-D).

This land will be owned by the Iter Legal Entity and hence will be dedicated to Iter use for as long as needed.

II.A.2. Geotechnical Characteristics

Requirement: ***The Iter Site shall have foundation soil-bearing capacity adequate for building loads of at least 25 t/m^2 at locations where buildings are to be built. Nevertheless, it is expected that it will be possible to provide at the specific location of the Tokamak Building means to support the average load of 65 t/m^2 at a depth of 25 m. The soil (to a depth of 25 m) shall not have unstable surrounding ground features. The building sites shall not be susceptible to significant subsidence or differential settlement.***

At the Clarington site, the foundation conditions in the area proposed for Iter consist of a thick layer of dense glacial till overlying bedrock. The bedrock is fairly level, and is found at a depth of about 25 m below grade. The load bearing capacity of the bedrock is very high, probably exceeding 100 tons/m^2. The load bearing capacity of the glacial till is fairly consistent over its vertical range, and is about 40 tons/m^2. In some areas of the site the till is interrupted by a layer of sand, silt, and clay; however, it is also quite strong. To accommodate the higher load of the Tokamak Building, embedded about 16 m below grade, pilings or caissons are anticipated to be used in the generic design to transmit the weight of the building to the bedrock. In the foundation conditions located at Clarington, it may be advantageous to increase the embedment of the tokamak building, so that the upper horizontal port elevation is aligned with grade. Iter Canada proposes that this strategy be adopted, permitting the tokamak building to be constructed on bedrock. This strategy would eliminate all question about the load bearing capability of the site, and also allow for cost savings associated with thinning of the basemat. This design change would also permit lowering the height of the crane rails and roof in the adjacent laydown, assembly, and RF heating building. To avoid any differential settlement between the tokamak building and the adjacent laydown or hot cell buildings, pilings or caissons would be used to transmit the basemat loads to the bedrock.

The Clarington site has no history of seismic activity, groundwater control requirements, or subsidence. The site is very well characterized, with a large number of borehole investigations undertaken for the development of the Darlington project.

II.A.3. Water Supply

Requirement: ***The Iter Site host shall provide a continuous fresh water supply of 0.2 m^3/minute average and 3 m^3/minute peak consumption rates. The average daily consumption is estimated to be about 200 m^3. This water supply shall require no treatment processing for uses such as potable water and water make-up to the plant de-mineralized water system and other systems with low loses.***

Clarington municipal water supply services are sufficient to supply this requirement. These supplies come to the site by pipeline in an existing access corridor. The system was utilized during the construction of Darlington, and should be adequate for the needs of Iter construction and operation.

II.A.4. Sanitary and Industrial Sewage

Requirement: ***The Iter site host shall provide sanitary waste capacity for a peak Iter site population of 1000. The host shall also provide industrial sewage capacity for an average of 200 m^3/day.***

It is planned to connect to the Clarington municipal sanitary sewage system for both sanitary and industrial waste capacity.

II.B Heat Sink

Requirement: ***The site shall have the capacity to dissipate, on average, 450 MW (thermal) energy to the environment.***

The Darlington Nuclear Generating Station rejects waste heat directly to Lake Ontario via once-through condenser cooling. Under existing licenses and restrictions, Darlington can withdraw additional water from Lake Ontario. Ontario Power Generation, the operator of Darlington Nuclear Generating Station, has agreed to supply makeup water to Iter. This water will be withdrawn from the generating station forebay. However, existing rules and regulations impose restrictions on the return of heated water to the lake. As described in Section 5, the Iter heat rejection requirements will probably best be met by the installation of mechanical draft cooling towers. Hot and cold basins will be used to minimize the size of the cooling towers, as is the case in the Iter generic design. The most economical design would use wet, mechanical draft cooling towers, however, Clarington conditions are such that dry cooling towers might be selected to avoid problems associated with production of fog or ice.

II.C Energy and Electrical Power – Plant Steady State Electrical Loads

Requirement: ***The Iter Site shall be capable to draw 120 MW continuous electrical power. Power should not be interrupted because of connection maintenance. At least two connections should be provided from the supply grid to the site.***

As described in Section 5, The Clarington site is adjacent to a major node on the Ontario electric grid, and there is ample grid capacity for the Iter needs. The primary grid voltage at Clarington is 500 kV. Two parallel, independent tie-ins to this grid are proposed for the Iter pulsed power needs (magnet power and plasma heating systems) and steady state electrical loads. The length of new overhead transmission lines will be about 660 m. These connections will be made so that either line can be removed for service during maintenance. The grid is sufficiently robust at this location that all Iter needs can be met at any time, without concern about the operating status of the adjacent Darlington units.

II.D Transport and Shipping

II.D.1 Maximum Size of Components to be shipped

Requirement: ***The Iter site shall be capable of receiving shipments for components having maximum dimensions (not simultaneously) of about:***

- ***Width – 9 m***
- ***Height – 8 m***
- ***Length – 15 m.***

The Clarington site is accessible by road transport, railroad, and barge. The highway access is via a multi-lane limited access freeway (Ontario Route 401- the McDonald-Cartier Freeway), which connects to all major highways and freeways in and around the greater Toronto area. Objects greater than 4 m in height or width will require oversize permits, and special precautions will be required for objects taller than 5 meters. A railroad line passes through the Darlington site, and a dedicated siding already exists. Objects transported by rail can arrive at the site within about 800 meters of the tokamak building directly onto the Iter property. Two docks are available at the site – the Darlington Nuclear Generating Station barge dock and the Blue Circle Cement Plant deep water dock (see Section 5.2.1.8.). For the Darlington generating station, large CANDU reactor calandrias were delivered to the site by barge. A barge slip exists in the forebay entrance. Objects that exceed the Iter shipping envelope could be delivered by barge to this slip and then transported by wheeled vehicles to the tokamak building entrances. The maximum barge width that could be accommodated at Darlington is about 30 metres. Objects shipped to the site by ocean freight can be transferred from deep water ocean freighters at Montreal, and shipped by barge or lake freighter to the site, or alternatively off-loaded directly at the Blue Circle dock. The Saint Lawrence Seaway limits the draft and width of ships to 7.5 m and 24 m, respectively. Objects such as the largest PF coils could still pass through the Seaway, but would have to be carried in an inclined position to meet the width restriction. The lakefront locations of the Canadian site creates the possibility that the envelope for objects shipped to the site could be increased. It is even conceivable that assembled TF/VV sectors might be completed elsewhere and shipped to the site.

II.D.2 Maximum Weight of Shipments

Requirement: ***The Iter site shall be capable of receiving about a dozen components (packages) having a maximum weight of 600 t and approximately 100 packages with weight between 100 and 600 t each.***

As noted in Section 5.2.1.8. these weights can be easily handled at either the Blue Circle Cement or the Darlington Nuclear Generating Station docks, as has been demonstrated in the past during the construction of the Darlington Nuclear Generating Station.

II.E External Hazards

There are no compulsory requirements.

The Clarington site has no special requirements with regard to external hazards. Natural external hazards such as seismic activity and extreme weather are discussed below, but are not significant. Man-made hazards such as transportation of hazardous material on the CN rail line, or on Lake Ontario are expected to be easily tolerated. This same class of hazards was examined in regard to the licensing of the Darlington generating station. The only restriction needed was the construction of an earthen berm between the rail line and the Darlington plant. Excavation spoils from Iter can be used to extend the existing berm and provide an identical level of protection for Iter. Highway and lake transportation hazards are sufficiently distant from Iter to eliminate the need for any active mitigation.

II.F Infrastructure

There are no compulsory requirements, but as noted in Section 5 of this Plan, the Clarington site infrastructure accommodates Iter very well.

II.G Regulatory and Decommissioning

Requirement: ***Details of the regulatory framework for Iter will depend on the Host Country. At a minimum, the Host's***

regulatory system must provide a practicable licensing framework to permit Iter to be built and to operate, taking into account, in particular, the following off-site matters:

1. ***the transport of kilograms of tritium during the course of Iter operations;***
2. ***the acceptance and safe storage of activated material in the order of thousands of tonnes, arising from operations and decommissioning.***

The agreement with the Host should provide for the issue of the liability for matters beyond the capability of the project that may arise from Iter construction, operation and decommissioning.

As discussed in detail in Section 7 of this Plan, the exiting regulatory framework fully accommodates the design, construction, operations and decommissioning of Iter through the *Canadian Nuclear Safety and Control Act* and its Regulations. The Iter Canada plan fully accommodates the acceptance and safe storage of all anticipated activated materials.

Since the Clarington and Darlington nuclear generating sites are adjacent to each other, and the source of the tritium is at the Darlington Nuclear Generating Station, tritium could be transferred to Iter, without ever leaving a site that has been licensed by the Canadian Nuclear Safety Commission. This proximity should eliminates any concerns that might exist regarding transportation of tritium across public areas. (See also Section 12.2 with respect to transportation of tritium.)

10.3 SITE DESIGN ASSUMPTIONS COMPARISON

III Site Design Assumptions

III.A.1 Land Area

Assumption: ***During the construction it will be necessary to have temporary use of an additional 30 hectares of land adjacent to or reasonably close to the compulsory land area. It is assumed this land is available for construction laydown, field engineering, pre-assembly, concrete batch plant, excavation spoils and other construction activities.***

During operating phases, this land should be available for interim waste storage, heavy equipment storage and activities related to the maintenance or improvement of the Iter Plant.

As shown in Section 5, a detailed site layout has been developed for Iter, using the southern part of the Clarington site. It includes all the required land areas for the project, while still leaving an almost equivalent area for future uses:

Use	Area (Ha)
High Security Area (inside Double Fence) – contains tokamak and most other Iter buildings	15.1
Switchyards	7.1
Cooling towers and basins	2.5
Rail Siding	7.2
Concrete Batch Plant	2.4
Permanent Parking and LOB (a second option for placing the LOB near the highway exists)	2.0
Construction Parking	6.0
Contractor 1 Laydown	4.7
Contractor 2 Laydown	5.9
Contractor 3 laydown	2.8
Temporary Buildings & Pipe Warehouse	5.7
Spoils Areas	9.5
Subtotal	**70.9**
Roads and Unassigned	**113.1**
Total	**184**

III.A.2 Topography

Assumption: ***The Iter site is assumed to be a topographically "balanced" site. This that the volumes of soil cuts and fills are approximately equal over the compulsory land in Requirement A.1. The maximum elevation change for the "balanced" site is less than 10 m about the mean elevation over the land area in the compulsory requirement.***

The Clarington site was originally part of the Darlington Nuclear Generating Station. This site was prepared for the future construction of Darlington B. As a result, the site where Iter would be located is quite flat. Excavated material which must be removed for the tokamak, laydown, hot cell, and tokamak access control structure can readily be disposed on the Clarington site, in two areas already identified for spoils, south of the CN tracks. Part of this material will be used to extend an existing earthen berm on the south side of the CN tracks, to protect the Iter facilities from any rail-borne transportation hazards.

III.A.3 Geotechnical Characteristics

Assumption: ***The soil surface layer at the Iter Site is thick enough not to require removal of underlying hard rock, if present, for building excavations, except in the area under the Tokamak Building itself, at an excavation of about 25 m.***

The Clarington site meets this assumption. The overlying glacial till on the Clarington site is generally deep enough to preclude the need for excavation of hard rock. Piles or caissons may be used to connect the tokamak building basemat to the bedrock, however, Canada proposes to embed the tokamak building about 5 m deeper than currently designed. This additional embedment would permit the building to be constructed with a thinner basemat, directly on the bedrock. It would not require that any of the bedrock be excavated. The height of the assembly hall and design of the hot cell building would also be modified to maintain the alignment of various building features.

III.A.4 Hydrological Characteristics

Assumption: ***Ground water is assumed to be present below 10 m below nominal grade, well above the tokamak building embedment of up to 25 m below nominal grade. This assumption will require engineered ground water control during the construction of the tokamak building pit.***

On the Clarington site, groundwater pockets are expected in the layer of sand, silt, and clay that may lie between layers of dense glacial till. The sand and silt are probably charged with groundwater from surface water in areas north of the proposed site. If encountered during excavation, pumping on nearby wells can drain these groundwater reservoirs. It is not expected that there will be any significant groundwater flow from Lake Ontario into excavations for the Iter buildings. Groundwater control at Clarington is not expected to present any significant difficulties.

Rainfall and seepage at the Clarington site is likely to be large enough to require that the excavations be pumped. However, it is not expected that pumping needs will be significant.

III.A.5 Seismic Characteristics

Assumption: ***The Iter seismic design characteristics for the applicable Safety Importance Class (SIC) are based an on assumed seismic hazard curve. Using the IAEA seismic classification levels of SL-2, SL-1, and SL-0 and the assumed seismic hazard curves [derived seismic specifications have been arrives based on a 10,000 year return period and 50% confidence level]. (The details are not reproduced here.)***

The seismicity of the Clarington site is such that the design basis earthquake has an acceleration of 0.05 g. This low seismic load value has important design consequences for the Iter safety related buildings. Using Canadian design practices and the seismic conditions at Clarington, the seismic load is not expected to control the design of safety related buildings. In some areas, this will result in important cost savings.

III.A.6 Meteorological Characteristics

Assumption: ***A general set of meteorological conditions are assumed for the design of buildings, civil structures and outdoor equipment.***

The Table on the next page compares the Iter design assumptions with the conditions expected to exist at Clarington. ***(To be updated.)***

Meteorological Parameter	ITER	Clarington
Maximum Wind Speed, km/hr	140	140
Maximum Air Temperature, 24 hr average, degrees C	30	30
Minimum Air Temperature, 24 hr average, degrees C	-15	-22
Maximum Relative Humidity, 24 hr average, percent	95	95
Maximum Relative Humidity, 30 day average, percent	90	90
Elevation above sea level, m	<500	75
Maximum Snow Load, kg/m^2	150	214
Maximum Icing, mm	10	15
Maximum Rainfall, 24 hrs, cm	20	7.6
Maximum Rainfall, 1 hr, cm	5	5
Worst Case Air Pollution (IEC 71-2), Level	3	3

III.B Heat Sink: Water Supply for Heat Rejection System

Assumption: ***The JCT has selected forced draft (mechanical) cooling towers as a design solution until the Iter site is selected. At 30% pulse duty cycle (450 MW average heat rejection) the total fresh ("raw") water requirement is about 16 m^3/ minute. This water makes up evaporative losses and provides replacement for blowdown used to reduce the accumulation of dissolved and particulate contaminants in the circulating water system. During periods of no pulsing the water requirement would drop to about 5 m^3/ minute.***

Each blowdown action will lead to a peak industrial sewage rate of 3000 m^3/day.

The makeup water supply for wet cooling towers can be provided from the Darlington generating plant water intake. The established permits for Darlington allow water withdrawal from Lake Ontario in excess of Darlington needs. This excess withdrawal capacity is more than sufficient for Iter cooling tower makeup needs. The blowdown will be rejected to the industrial sewer, and will undergo some treatment before it is discharged to the environment. The capacity of the industrial sewer system can accommodate the Iter flows, including cooling tower blowdown.

III.C Energy and Electrical Power

III.C.1 Electrical Power Reliability during Operation

Assumption: ***(Paraphrasing) Single phase faults of less than 1 second are assumed to occur no more than a few tens of times per year. Single phase faults of up to 5 minutes duration are assumed to occur less than an few times per year, and three phase faults of any duration are assumed to occur less than 5 times per year.***

As detailed in Section 5.2.1.3, the Clarington site is located adjacent to a major node on one of the most stable grids in North America, and in the world. Frequency of faults at either of these sites should be significantly below the Iter assumptions.

III.C.2 Iter Plant Pulsed Electrical Supply

Assumption: ***A high voltage line supplies the Iter "pulsed loads". The following table shows the "pulsed load" parameters for the Iter Site (note all details reproduced here):***

Characteristic	***Values***
• ***Peak Active Power:***	***±500 MW***
• ***Peak Reactive Power:***	***400 MVAR***
• ***Power Derivative:***	***200 MW/s***
• ***Power Steps:***	***±60 MW***
• ***Fault Level***	***10-25 GVA***
• ***Pulsed Power Period***	***1000 seconds***
• ***Pulse Repetition time***	***1800 seconds***

Detailed modeling of the interaction between Iter and the Ontario grid has been performed (see Section 5.2.1.3.). Results of this analysis indicate that the pulsed power loads from Iter can be accommodated by the grid at Clarington without any overall effect on the electrical supply system.

It is also possible that the grid could accept a higher reactive power load, and that the Iter project could enjoy a cost saving through a reduction in the amount of reactive power compensation capacity.

III.D Transport and Shipping

III.D.1 Highway Transport

Assumption: ***The Iter Site is accessible by a major highway which connects to major ports of entry and other centres of commerce.***

As discussed in detail in Section 5 and 8, the Clarington site is adjacent to one of Canada's major highway links (Highway 401) which provides superb connections to all North American centres.

III.D.2 Air Transport

Assumption: ***The Iter Site is located within a reasonable commuting time from an airport with connections to international air service.***

As detailed in Section 8, the Clarington site is less that one hour from the Lester B. Pearson international airport (Toronto's major airport), with most of the worlds major airlines providing non-stop or direct flights to most of the world's major centers.

III.D.3 Rail and Waterway Transport

Assumption: ***It is assumed the Iter Site will have rail and waterway access. The railway is assumed to connect to major manufacturing centres and ports of entry.***

Again as described in Section 5, the Clarington site has a spur line off the mainline of the Canadian National Railways (CNR), which passes through the Clarington site itself.

The Clarington site is connected directly to tidewater via the St. Lawrence seaway, and two alternative docks are available adjacent to the Clarington site property.

III.E External Hazards and Accident Initiators

III.E.1 External Hazards

Assumption: ***It is assumed that the Iter site is not subject to significant industrial and other man-made hazards.***

III.E.2 External (Natural) Accident Initiators

Assumption: ***It is assumed that the Iter location is not subject to horizontal winds greater than 140 km/hr (at an elevation of 10 m) or tornadic winds greater than 200 km/hr. The Iter Site is not subject to flooding from streams, rivers, sea water inundation, or sudden runoff from heavy rainfall or snow/ice melting (flash flood). All other external accident initiators except seismic events are assumed below regulatory consideration.***

Man-made and natural hazards at the Clarington site have been evaluated to determine their effect on the safety of the Darlington Nuclear Generating Station located at the adjacent site. To preclude any missiles from explosions on the train tracks passing through the property, an earthen berm has been constructed alongside the CN track. This berm will be extended, using spoils from Iter excavation, and will protect Iter from the same hazards.

Extreme weather conditions such as high winds and tornados have been examined and used to establish design conditions for the Darlington Nuclear Generating Station. Tornados have been observed at the Darlington site, but are rare and not powerful. The same design basis events can be applied to Iter. Generally, these conditions are not more severe than the Iter assumptions. No mechanism has been identified which could lead to a flooding event at the Darlington Nuclear Generating Station site.

III.F Infrastructure

III.F.1 Industrial

Assumption: ***It is assumed the Iter Site has access to the industrial infrastructure that would typically be required to build and operate a large, complex industrial plant. Industrial infrastructure includes scientific and engineering resources, manufacturing capacity and materials for construction. It is assumed the Iter Site location does not adversely impact the construction cost and time period nor does it slow down operation. The following are examples of the specific infrastructure items assumed to be available in the region of the site:***

- ***Unskilled and skilled construction labour***
- ***Facilities or space for temporary construction labour***
- ***Fire protection station to supplement on-site fire brigade***
- ***Medical facilities for emergency and health care***
- ***Contractors for site engineering and scientific services***
- ***Bulk concrete materials (cement, sand, aggregate)***
- ***Bulk steel (rebar, beams, trusses)***
- ***Materials for concrete forms***
- ***Construction heavy equipment***
- ***Off-site hazardous waste storage and disposal facilities***
- ***Industrial solid waste disposal facilities***
- ***Off-site laboratories for non-radioactive sample analysis.***

All of these items are met by the Clarington site, as described in Sections 5, 6 and 8. This is also illustrated by the successful construction of the Darlington power station. Further elaboration on several issues is below.

Construction Labour: During the construction phase of the Iter a large construction labour pool will be required. Iter at Clarington will be able to draw upon the large construction/labour force available in the Municipality of Clarington and the neighbouring municipalities, cities and towns which are within commuting distance.

The Toronto Economic Region which includes Toronto and Durham Region has a large and growing Construction Labour Force as shown below:

Total Construction Labour Force		
	1998	**1999**
Employed	118,000	126,700
Unemployed	7,900	6,800

Source: Labour Force Survey, Statistics Canada

The large number of unemployed construction labour will undoubtedly meet the need for 1500+ construction workers that will be required during the construction phase of the facility. The supply of labour can be met due to the tremendous population growth experienced and projected in Durham Region.

Fire Protection Services: The Municipality of Clarington has the capability to supplement the on-site fire brigade at the Darlington facilities. The Clarington Fire Department is a composite department comprised of 30 full-time firefighters, 4 dispatchers, 2 Fire Prevention Officers and 120 part-time firefighters. Fire Stations are located in Bowmanville, Courtice, Newcastle Village, Orono and Enniskillen. The headquarter station, located on Highway #2 just west of Regional Road 57, is within 3.6 km from the site.

In addition, the nearby City of Oshawa also has a large fire department with over 140 full-time firefighters, 10 dispatchers, 8 fire prevention officers and 4 fire stations.

Material Supply and Waste Disposal: Material supply and waste disposal services are readily available in Clarington, Durham Region and Toronto. The table below shows the number of firms that provide these services.

Material, Supply and Waste Disposal Firms				
Service	**Clarington**	**Durham Region**	**Toronto**	**Outside Toronto**
Site Engineering & Scientific Services	2	24	25+	70+
Aggregate Extraction	20	88	0	164
Concrete Forms	1	1	26	20+
Bulk Steel	9	20	50+	70+
Large Scale - Heavy Equipment Rentals	2	3	8+	8+
Off-site Hazardous Waste Disposal	1	2	-	5
Industrial Solid Waste Treatment & Disposal	1 - Clarington owns its waste transfer treatment disposal facility	-	2	1
Off-site Laboratories for non-radio-active sample	2	24	25+	70+

In addition, there are 16 ready-mix concrete suppliers within the Greater Toronto Area and 7 more east and west of the area.

III.F.2 Availability of Workforce

Assumption: ***It is assumed that a competent operating and scientific workforce for the Iter Plant can be recruited form neighbouring communities or the workforce can be recruited elsewhere and relocated to the neighbouring communities.***

It is also assumed that Iter has the capability for conducting experiments from remote locations elsewhere in the world. These remote locations would enable "real-time" interaction in the conduct of the experiments, while retaining machine control and safety responsibilities at the Iter Site Control Facility.

Operating and scientific workforce (normally categorized under management, business, finance, administration and natural and applied sciences occupation type) can be easily recruited from the large labour force currently available within Clarington and the neighbouring communities. In addition to the existing labour force, new graduates are regularly available from the large number of universities and colleges in the area. The table below illustrates the size of the work force categorized by occupation type.

Occupation Type	Clarington	Durham	Toronto
Management	2,245	22,950	237,265
Business, Finance, Admin.	5,830	50,770	516,160
Natural & Applied Sciences	1,605	12,505	127,260
Health	1,660	10,560	90,090
Social Science, Education, Government, Religion	1,825	1,430	149,910
Art, Culture, Recreation and Sport	510	4,910	79,410
Sales and Service	6,910	57,840	536,860
Trades, Transport and Equipment Operators	5,380	34,755	245,060
Primary Industry	1,110	5,056	20,770
Processing, Manufacturing and Utilities	3,830	22,905	181,670

Census 1996, Statistics Canada

III.F.3 Socioeconomic Infrastructure

Assumption: ***The Iter site is assumed to have neighboring communities which provide socioeconomic infrastructure. Neighboring communities are assumed to be not more than 50 km from the site, or one-hour travel. Examples of socioeconomic infrastructure are described in the following list:***

- ***Dwellings (Homes, Apartments, Dormitories)***
- ***International schools from kindergarten to secondary school***
- ***Hospitals and clinics***
- ***Job opportunities for spouses and other relatives of Iter workers***
- ***Cultural life in a cosmopolitan environment***

All of these items are fully met with Iter sited at Clarington. Section 8 goes into detail on all of these issues.

Because it located within the Greater Toronto Area with a population of greater than 4.5 million, the Clarington site is expected to be very attractive to potential Iter staff members. Toronto is a sophisticated and cosmopolitan city, offering an exceptional range of educational and cultural amenities.

III.G Regulatory and Decommissioning

III.G.1 General Decommissioning

Assumption: ***During the first phase of decommissioning, the Iter operations organization places the plant in a safe, stable condition. Dismantling may take place decades after the "deactivation" phase. Dismantling of Iter is assumed to be the responsibility of a new organization within the host country. The Iter operations organization will provide the new organization all records, "as-built prints", information an equipment pertinent to decommissioning. Plant characteristics will also be provided for dismantling purposes after "deactivation".***

III.G.2 Iter Plant "Deactivation" Scope of Work

Assumption: ***The Iter operations organzation will develop a plan to put the plant in a safe, stable condition while it awaits dismantling.***

Residual tritium present at the end of Iter operations will be stabilized or recovered to secure storage and/or shipping containers.

Residual mobile activation products and hazardous material present at the end of Iter operations will be stabilized or recovered to secure storage and/or shipping containers such that they can be shipped to a repository as soon as practical.

Iter deactivation will include the removal of in-vessel components and their packaging in view of long-term storage. This removal from the vacuum vessel will be done by personnel and remote handling tools, trained for maintenance during the previous normal operation.

Liquids used in Iter systems may contain activation products, which must be removed before they can be released to the environment or solidified as waste. It is assumed that all liquids will be rendered to a safe, stable form during the "deactivation" phase, and afterwards no more cooling will be necessary.

Iter "deactivation" will provide corrosion protection for components which are vulnerable to corrosion during the storage and dismantling period, if such corrosion would lead to spread of contamination or present unacceptable hazards to the public or workers.

The Licensing – Section 7, and Technical Scope – Section 5, of this Plan present a plan for all the phases of Iter at the Clarington site. All the Regulatory, Deactivation and Decommissioning requirements will be met, and confirmed as part of the licensing process for Iter at Clarington. All of these plans will also be incorporated into the environmental assessment for Iter at Clarington.

III.H Construction Phase

Assumption: ***General requirements for the Construction Phase (except land) are very dependent on local practice. However,***

water, sewage and power supplies need to be provided at the site for a construction workforce of up to 3000 people.

As described in Section 5, all of these requirements are met by the Iter Canada plan for Iter at Clarington, and has been demonstrated in the past during the construction of the even larger Darlington Nuclear Generating Station.