

DARLINGTON Waste Management Facility



Darlington Waste Management Facility, to be completed mid-2007

Facility Description

As the Darlington used fuel bays are nearing their storage capacity, the Darlington Waste Management Facility (DWMF) is being constructed to ensure continued operation of the station.

The DWMF will be similar to facilities already in operation at the Bruce and Pickering sites and will consist of an amenities area, a processing building and a dry storage building.

Most of the used fuel from the Darlington reactors will be transferred to the DWMF and stored there until a long term fuel management strategy for Canada is determined and implemented.

When the facility goes into operation in mid-2007 the first storage building will be capable of holding approximately 500 Dry Storage Containers (DSCs), each holding 384 used nuclear fuel bundles.

In addition to the construction of the Waste Management Facility, the Darlington used fuel bays are being modified to facilitate the loading of used fuel into the DSCs.

Highlights

- The DWMF is being constructed to ensure continued operation of the station.
- The DWMF will be similar to facilities already in operation at the Bruce and Pickering sites



Darlington Waste Management Facility, to be completed mid-2007

DARLINGTON Waste Management Facility

Used Fuel Dry Storage



Used fuel is stored for at least 10 years under water in fuel bays at Darlington Nuclear. The water keeps the fuel bundles cool and provides an effective radiation shield.

When the fuel bundles are removed from the reactors at the Darlington site, they are radioactive and need to be managed safely and responsibly for an extended period of time. The first step is to cool the fuel bundles under water years in specially engineered used fuel bays.

As the Darlington fuel bays become full, it will be necessary to transfer the used fuel from the fuel bays into robust concrete and steel containers and store them in the DWMF on the station site. The containers – called Dry Storage Containers (DSCs) – are engineered to last at least 50 years and will provide safe, interim storage until a long-term management program is in place. This dry storage process is a proven, safe and regulated technology that has been in use at the Pickering site since 1995 and the Bruce site since 2002.

The term “dry storage” comes from the fact that the used fuel is stored in a dry state, contained and shielded by the concrete and steel in the DSCs and not by water as in the used fuel bays.

Dry Storage Process

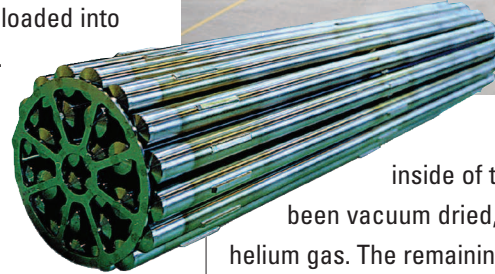
The process of loading a dry storage container with used nuclear fuel begins by submersing the base of the 63-tonne container into one of Darlington’s water filled used fuel bays. Once in the storage bay, four modules each containing 96 used fuel bundles are loaded into the container under water.

The used fuel bundles have been stored in the water filled bay for at least 10 years, during which they have cooled and become less radioactive.

The lid of the container is then installed and secured to the base with a clamp.

The container, now holding 384 used fuel bundles is removed from the bay, drained, decontaminated and vacuum dried. It is then moved to the DWMF with one of the dedicated large transport vehicles. Once received at the DWMF, the lid is welded to the container’s base and the vent port is seal-welded. After the

After weld-sealing, painting and installation of the International Atomic Energy Agency safeguards seals, the dry storage containers will be placed in a warehouse-like building on-site at Darlington



inside of the container has been vacuum dried, it is filled with helium gas. The remaining drain port is then seal-welded. The helium gas provides a means of leak detection for the sealed container and creates an inert atmosphere for the stored used fuel. Before being placed into storage, the container undergoes rigorous testing to ensure that it is absolutely leak tight. Prior to placing the container into storage, safeguard seals are applied by an inspector from the International Atomic Energy Agency.

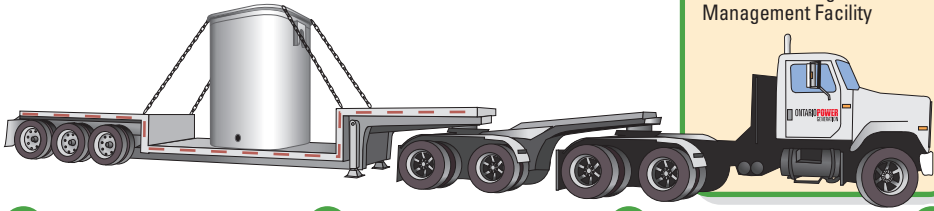
See page three for more details on the step-by-step process of preparing, loading, processing and storing dry storage containers.

The transporter will move DSCs containing used fuel from the station to the processing building at the DWMF.



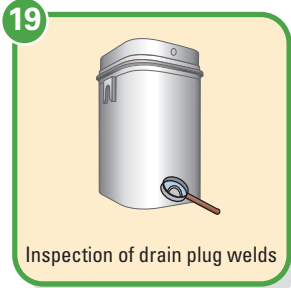
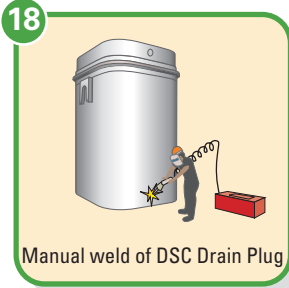
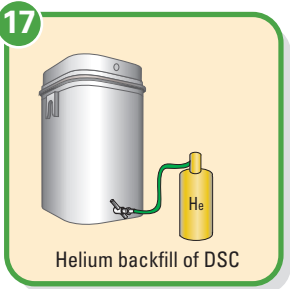
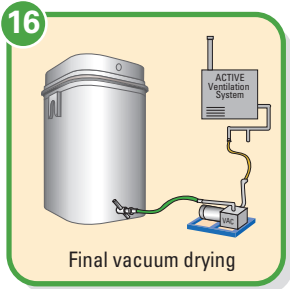
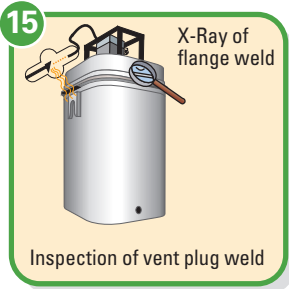
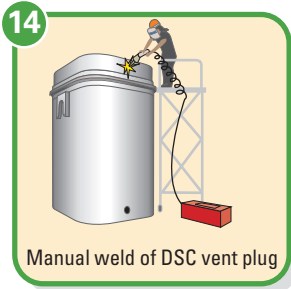
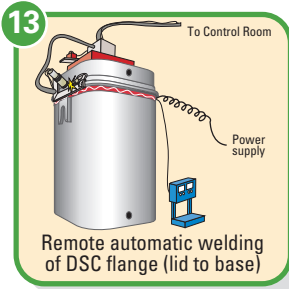
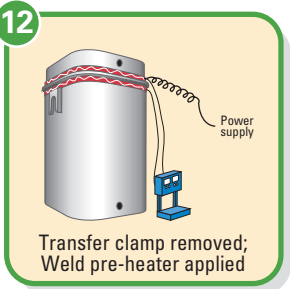
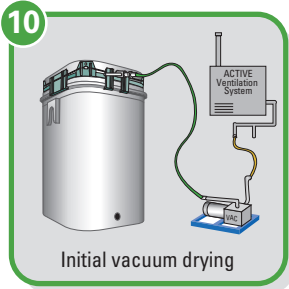
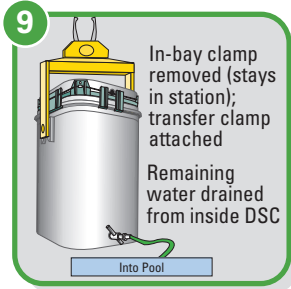
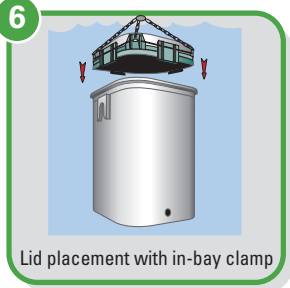
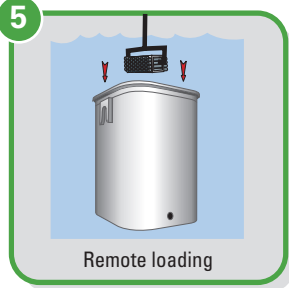
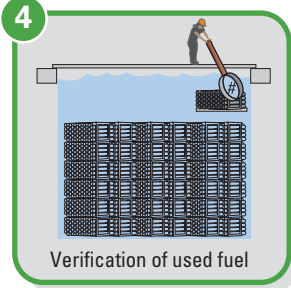
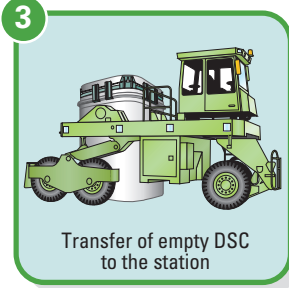
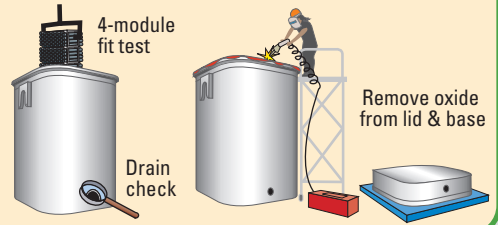
DARLINGTON Waste Management Facility

The Used Fuel Dry Storage Process



1 Dry Storage Container (DSC) delivered from manufacturer to OPG's Darlington Waste Management Facility

2 DSC preparation and checks at Dry Storage Facility (DSF)

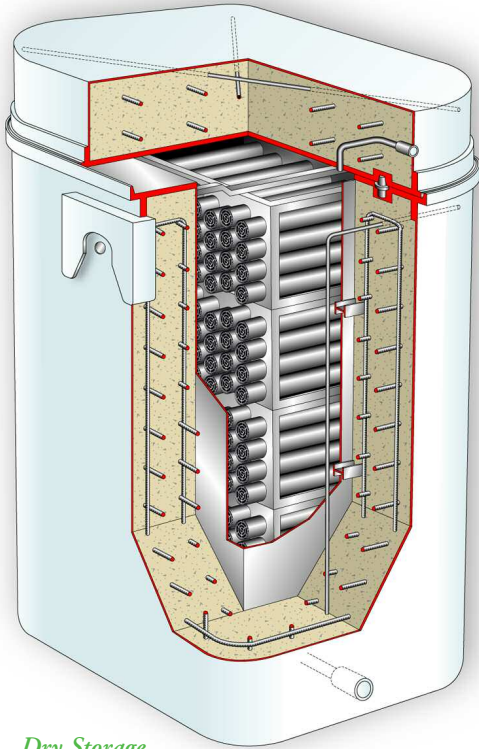


Operations at the Dry Storage Facility (DSF)

Operations at the Nuclear Generating Station (NGS) used fuel storage bay area

Transfer operations between NGS and DSF

DARLINGTON Waste Management Facility



Dry Storage Container (DSC)

Dry storage containers (DSCs) are extremely robust and provide an effective barrier against radiation. Each DSC is made of reinforced high-density concrete approximately 510 mm (20 inches) thick and is lined inside and outside with 12.7 mm (half-inch) thick steel plate.

A DSC loaded with used fuel bundles weighs 73 tonnes and can only be moved using a specially designed transporter which travels at a speed of only 4 km per hour.

Dry storage is a proven technology in use around the world. In Canada, dry storage is used by Hydro Quebec at Gentilly, New Brunswick Power at Point Lepreau and Atomic Energy of Canada at Chalk River and Douglas Point. Ontario Power Generation (OPG) currently has two dry storage facilities in operation, at the Pickering and Bruce sites.

Safety and Environment

OPG Nuclear Waste Management staff are well trained and regard safety and the environment as their top priority. They have accomplished significant milestones in these areas, such as achieving a long standing record of no "Lost Time Accidents". Safe work planning, following safe work practices and paying particular attention to detail, along with a safety conscious work attitude, has led to this excellent safety performance.

Through employing highly qualified staff, careful planning, development of technology and equipment and the use of sound operating procedures, OPG

has ensured that radioactive waste is managed safely and poses no significant risk to employees, the public or the environment.

Regulatory Authority

The overall regulation of nuclear reactor operation and waste management in Canada is the responsibility of the Canadian Nuclear Safety Commission (CNSC). The CNSC will monitor all nuclear waste activities to ensure that these operations pose no undue risks to people or the environment.

The DWMF will also be monitored on an ongoing basis by the International Atomic Energy Agency.

Security

Ensuring the security of the nuclear facilities at Darlington is of paramount importance. To compliment OPG's on site security staff, OPG has entered into an agreement with the Durham Regional Police Service to provide specially trained personnel on-site 24 hours a day, seven days a week.

For more information about Ontario Power Generation's nuclear waste management program and plans, please visit www.opg.com