E. HOW WE CONDUCT OUR BUSINESS

ENABLING OBJECTIVES:

1.15 Identify the major divisions within Ontario Hydro's Nuclear Business.

1.16 Describe the basic organisational structure of a nuclear generating station.

1.17 Describe the primary role in controlling the work within a nuclear station of the following licenced positions:

a) Station Director;

b) Shift Superintendent;

c) Shift Supervisor;

d) Authorized Nuclear Operator.

1.18 Given a list of the following job families or work groups, be able to match them with a list of job responsibilities:

Job Families	Work Groups
Operators	Health Physics Unit
Control Technicians	Quality Assurance Unit
Mechanical Maintainers	Safety Unit
Chemical Technicians	Technical Section
Civil Maintainers	Training Unit
Planning Technicians	Clerical Unit
Radiation Control Technicians	Payroll Unit
	Supply Services
	Comptrollers
	Construction Services
	Human Resources Unit
	Security Services

1.19 Describe the role of the Deficiency Report (DR) and the Daily Work Plan in identifying and responding to defective equipment or incorrect work processes.

1.20	Explain the purpose of self-checking.
1.21	Define self-checking.

This section is intended to introduce you to the organisational structure that determines how we conduct our business at a Nuclear facility. How well we conduct our business has a direct impact on whether we achieve the goals laid out by our key effectiveness areas.

ORGANISATION

Figure 1.9 shows the major divisions of the Nuclear Business. These are grouped into the **Electricity Production Business** comprised of the generating stations which constitute our primary source of income, the **Nuclear Services Business** which provides essential services to the generating stations as well as a secondary source of income (external heavy water sales), and **Nuclear Business Support** which provides financial and human resources services to the nuclear business as a whole.

It is important to bear in mind that the primary mandate of the nuclear business is to generate income through the production and sale to the Grid Company of electricity. Secondarily, income is also generated through the external sale of heavy water and steam. The efforts of all of us are directed towards these ends even if we work in a department that does not directly produce one of these products.

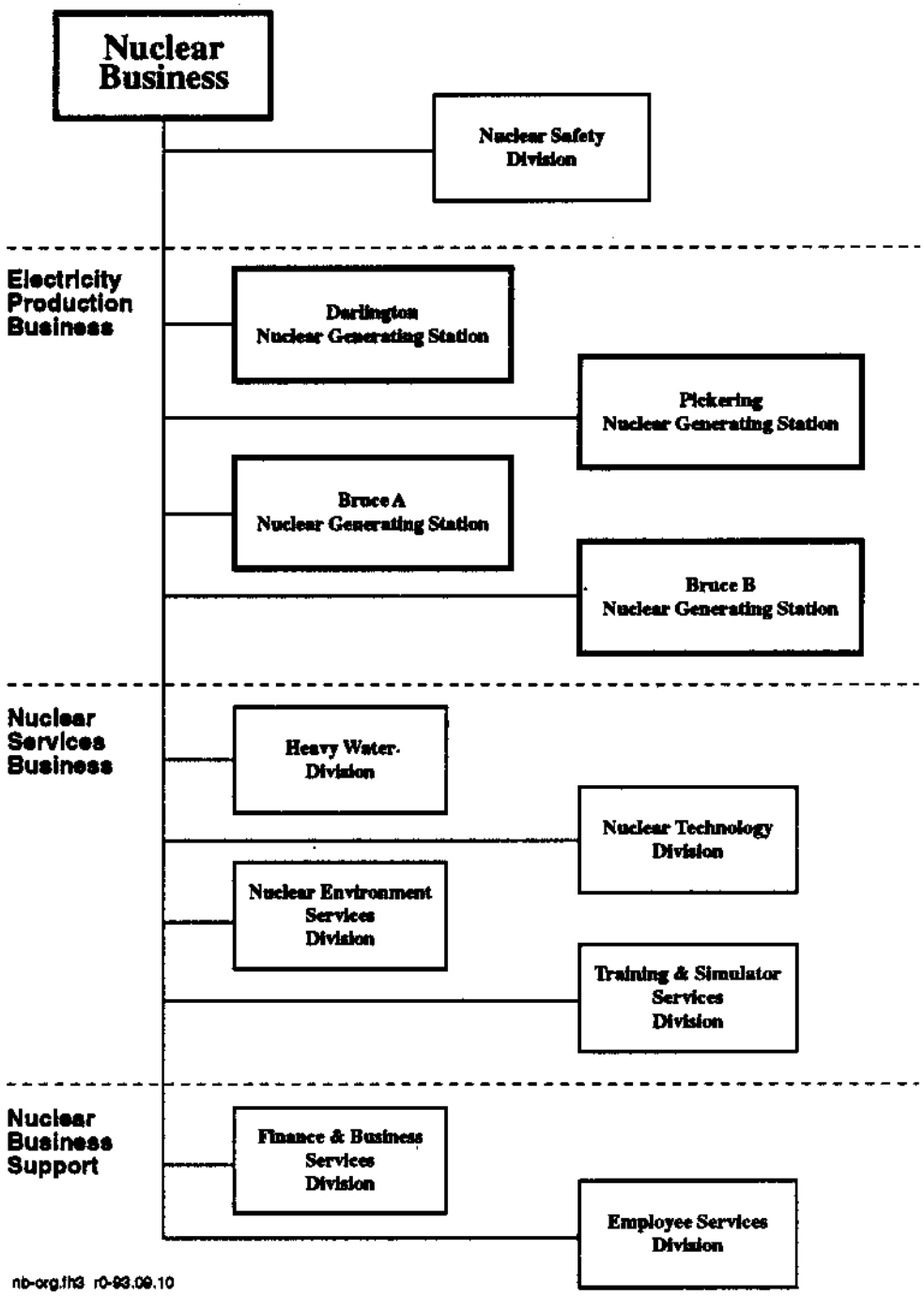

Figure 1.9
Ontario Hydro Nuclear Business

Given that our efforts revolve around the production of electricity, the generating station is very much the focus of this course. Figure 1.10

illustrates a typical organisational structure within a nuclear generating station.[14]

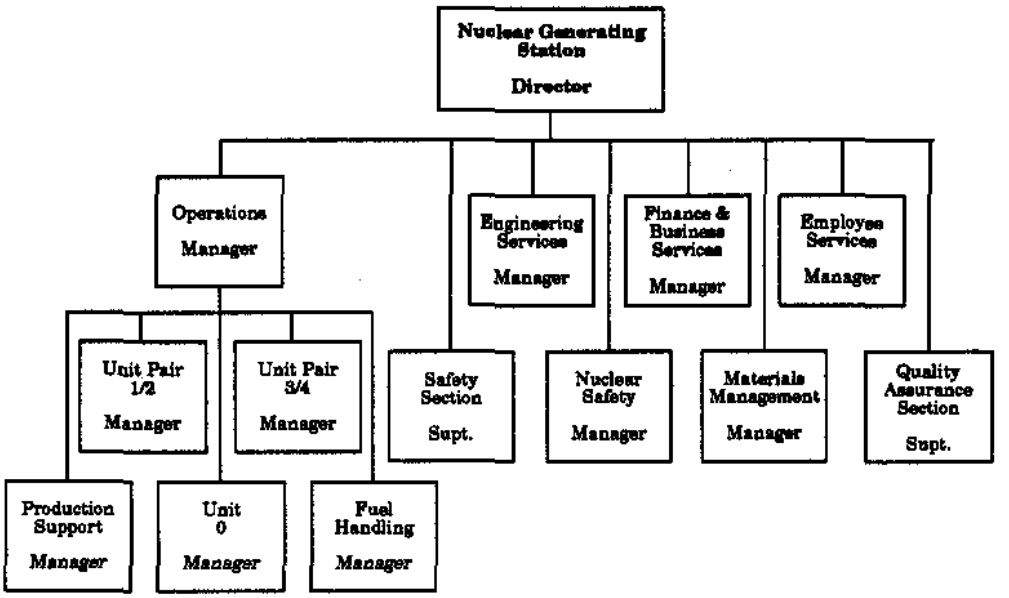

Figure 1.10
Nuclear Generating Station Structure

You will note that the major department within the station is **operations**. Operations is the department directly in charge of electricity production. The concept underlying the organisation of this department is known as **organizing for ownership**. This attempts to break up the large station into smaller self contained sections based on pairs of nuclear units and with the intent of promoting greater ownership among staff at the working level. The operations department also comprises a Unit 0 section that looks after the common functions, a Fuel Handling section that integrates fuel handling operations and technical support, and a Production Support section with responsibility for the day maintenance organisation.

Engineering Services is the next largest department. It provides both direct technical support to operations and the design function that used to be at Head Office. It is composed primarily of engineering and scientific staff who are responsible for monitoring station operation and for specifying upgrades. The engineering services department is also the design authority for the station and acts as a liaison with external technical support groups such as Nuclear Technology Services or Atomic Energy of Canada Limited. The other departments are small compared to operations and engineering services. They report directly to the station director

[14] Other departments may be organized on roughly similar lines.

because their responsibilities cut across the major divisions within the station. In total, they provide services that make the station virtually self-contained.

THE ROLE OF LICENCED POSITIONS WITHIN THE NUCLEAR STATION

As discussed in section B, nuclear stations are operated within the framework of the station operating licence granted by the AECB. The AECB is responsible for verifying that operation is carried out within the terms of the licence. Those terms require the following positions within the station organisation to be approved or licenced[15] by the AECB:

- Station Director/Operations Manager/Unit Pair Manager;
- Shift Superintendent;
- Shift Supervisor;
- and, Authorised Nuclear Operator.

The approved and licenced positions are highlighted in figure 1.11.

[15] For positions up to the Shift Superintendent, the licence from the AECB is dependent on extensive experience and completion of a training programme approved by the AECB. Associated with the training programme are a series of exams set by the AECB. Approval of managers usually requires previous experience as a Shift Supervisor/Superintendent and always requires a formal interview with the AECB.

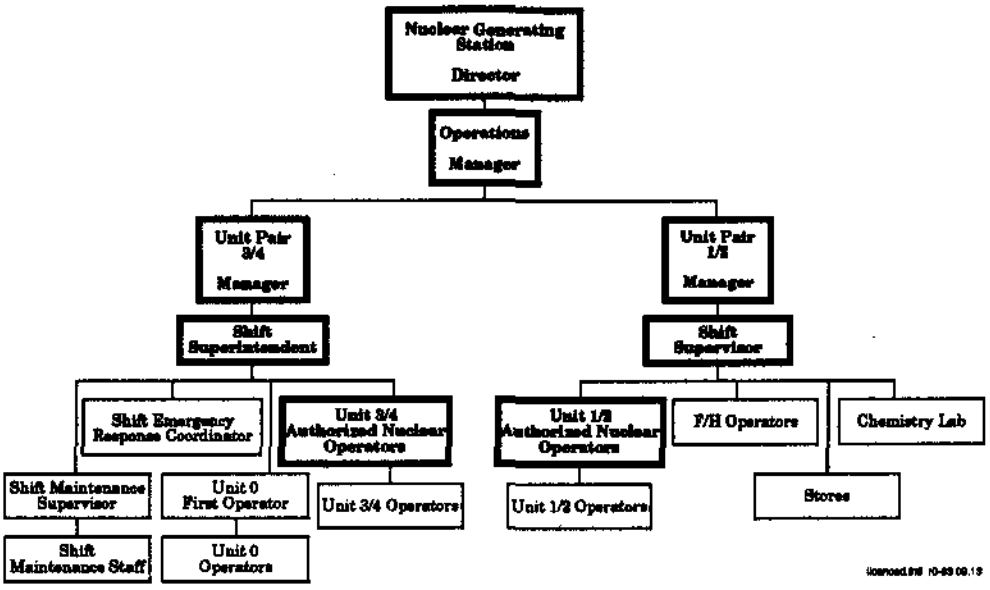

Figure 1.11
Licenced Positions in a Nuclear Generating Station

The role of the **Station Director** is to ensure that the station organisation and procedures will enable the station to be operated in compliance with the Operating Licence. The **Operations Manager** and **Unit Pair Managers** look after the actual operation of the station and act as the Station Director's delegate. One of these Managers is on call at all times.

The **Shift Superintendent** (SS) is the senior licence on shift and has the responsibility to ensure that the units are operated within the limits of the Operating Licence. Operation normally will follow approved procedures, but the SS does have the authority to deviate from procedures providing the deviations are within the limits of the licence. The SS carries out this mandate by monitoring closely all maintenance and operations carried out in the station through control of work approvals. The **Shift Supervisor** has much the same role as the Superintendent. The major distinction between the two positions is that the Shift Superintendent will normally have a technical background while the Shift Supervisor has come up through operations.

The responsibility of the **Authorized Nuclear Operator** (ANO) is to carry out operations according to approved procedures. The ANO exercises direct control over one **unit**[16] of the station and is reponsible for

[16] A unit is comprised of a reactor and turbine generator as well as associated support systems.

carrying out panel operations and directing field operations and maintenance on the unit.

The important feature of each of the above positions is that, in addition to normal supervisory responsibilities, they are directly licenced by the AECB to provide assurance that station operation is carried out within the limits of the Operating Licence. As such they are legally required to be intimately involved in the work carried out by most workgroups within the station through the work approval process.

THE JOB FAMILIES THAT MAKE UP THE STATION STAFF

We have already looked at the structure of the Nuclear Business, and the organisation of a typical nuclear station. We have also looked at why licenced staff carefully control the work carried out within the station. We will now introduce the responsibilities of each of the job families[17] and work groups[18] within a nuclear station.

TABLE 1
Job Family Responsibilities

Job Family	Responsibility
Operators	Operation of the plant, including routine monitoring of process parameters to ensure that the plant is operating within the limits of the Operating Licence, and routine testing of standby systems.
Control Technicians	Repair and maintenance of electrical and instrumentation equipment throughout the plant in support of the Operations group.
Mechanical Maintainers	Repair and maintenance of mechanical equipment throughout the plant in support of the Operations group.
Chemical Technicians	Monitoring the condition of process fluids used in the many plant processes to ensure that chemical balances are maintained within limits defined in station procedures.
Civil Maintainers	Provide a variety of civil maintenance services to the station such as scaffolding, building trades, janitorial services, landscaping.

[17] Major classifications of trades staff.
[18] Organisational units with a station.

Planning Technicians	Provide planning and scheduling support services to coordinate the efforts of all station or plant groups in such a way that overall objectives are satisfied in the optimum way.
Radiation Control Technicians	Provide radiation protection advice to field Production staff. Carry out radiation surveys.

TABLE 2
Work Group Responsibilities

Work Group	Responsibility
Health Physics Unit (Nuclear Safety Dept.)	Provide advice and assistance for the management of employee and public radiation safety. Provide standards, approvals and rulings for the management of employee and public safety. Carry out elements, and provide assessments, of the station radiation safety work programme. Train station staff in radiation protection.
Quality Assurance[19] Section	Establish and maintain the station Quality Assurance (QA) Manual. Monitor QA programmes and provide assistance to station sections to set up and maintain their quality assurance programmes.
Safety Section	Provide a safety audit of conventional functions for the station.
Engineering Services	Monitor, evaluate and report station operating data. Troubleshoot operating problems. Provide technical support to Production section. Act as liaison with external technical groups. Provide design authority.
Training Unit (external Training Dept.)	Provide station systems and safety training to staff at the station.
Clerical Unit (Finance & Business Services)	Provide filing, word processing, and other clerical services to other groups within the station.

[19] Quality Assurance (QA) is a process designed to provide confidence that the plant, systems, equipment and components are designed, built, tested, operated, and maintained by **competent workers** following **proper procedures** and all that is confirmed by **proper documentation**.

Payroll Unit (Finance & Business Services)	Provide payroll service to staff and monitor vacation usage.
Comptrollership (Finance & Business Services)	Assist line management in the financial management of the department's operation. Provide expertise in the areas of business planning, budgeting, financial reporting, internal control, and accounting. Thereby contribute to financial decision making processes that confront line management in day to day execution of their responsibility.
Materials Management	Provide advice to station staff on purchasing of materials and services. Look after purchasing of materials and services, and the tendering process.
Construction Services (only at Bruce A & Pickering)	Provide major construction services to the station for large projects or outage work that is beyond the capacity of normal station and/or service groups.
Employee Services	Recruit, deploy and develop qualified personnel. Provide advice to staff on personnel policies. Organise non-technical training for station staff.
Security Services	Look after the security of the site, both internal (issuing of proximity passes, investigation of theft, etc.) and external (issuing of site vehicle passes, exclusion of intruders, etc.).

PLANNING AND THE DEFICIENCY REPORT PROCESS

With the number of job families and distinct work groups within a department and the complexity of the work in hand, it is important to have an effective means of planning, prioritizing, and coordinating the work. As mentioned in Table 1, work in a production department is scheduled by planners in consultation with the work groups affected. A **daily work plan** is devised through a cooperative effort between operations and planning to provide guidance to the shift crews and day crew by listing and prioritizing the work to be accomplished. This work plan will specify the **operator routines** to be carried out. Routines are tasks that are performed more than once a week and usually involve inspection of equipment. The daily plan will also specify **call-ups** to be performed. Call-ups are maintenance routines or tests that are carried out on a pre-determined time cycle.

One of the major inputs to planning is the computer based **deficiency report** (DR) process. This process is intended to ensure that defective systems, equipment, structures or procedures in the station or plant are identified and corrected expeditiously. It provides a system to record deficiencies, analyse and assess, list corrective actions taken and store relevant information for Quality Assurance purposes. It will probably be through a DR that you have your first opportunity to input to the planning process because all of us have an obligation to prepare a DR for any deficiency that we have detected or suspect to exist.

Figure 1.12 shows a typical process for correcting a deficiency. This example uses a defective pump, but the general process is the same for any equipment, system or procedure. At this point in our studies, all we are interested in is the basic process; the details of how to fill out a DR will be covered later in training on the Information Management System.

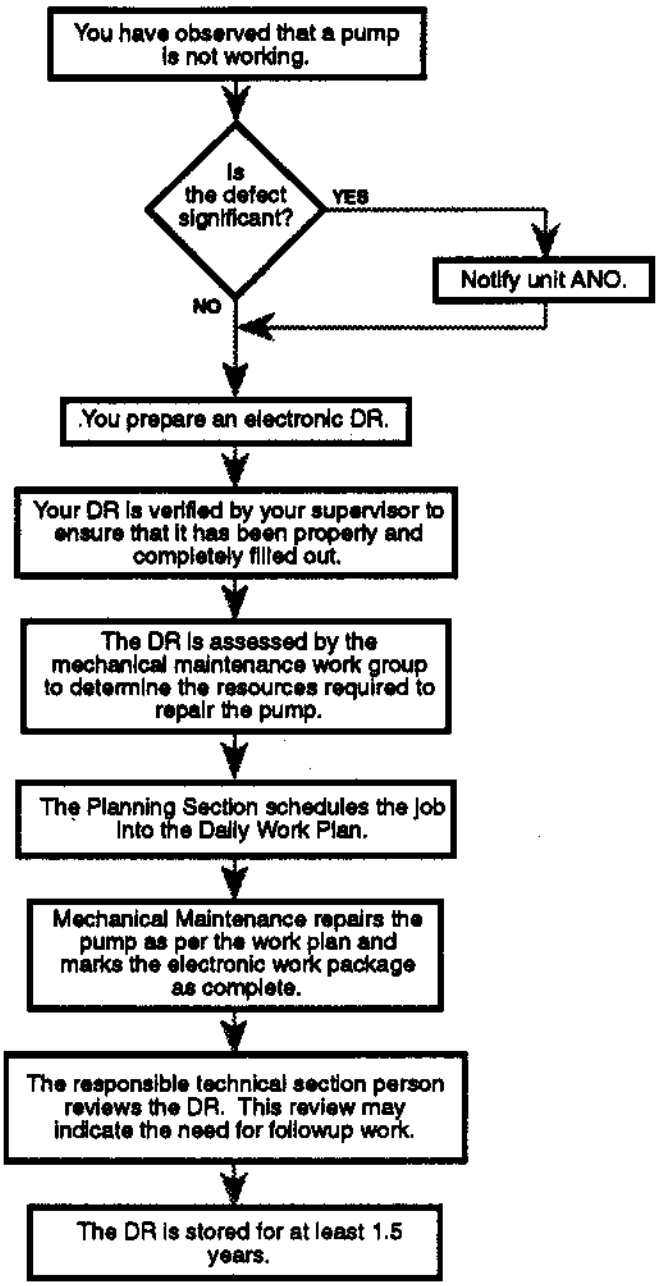

Figure 1.12
A Typical Process for Correcting a Deficiency

WRAPUP AND SELF-CHECKING

This module has introduced you to the operating philosophy of the Nuclear Business which ties together employee safety, public safety, reliability, environmental protection and product cost into the distinct way in which we conduct our business. This last section has outlined the business processes in place to support that philosophy. Ultimately it is our

responsibility to ensure that the philosophy and the processes are translated into action. It is up to us to make the system work so that the number of incidents that could endanger employee safety, public safety, reliability, the environment, or production are kept As Low As Reasonably Achievable.

One way to keep incidents low is through the technique of **self-checking**. This technique is designed to reduce the number of inappropriate actions that could lead to an incident by helping staff to focus consciously on the details of the task they are performing. A deliberate review of both an **intended action** and the **expected response** will often make it possible to identify a potential problem before it becomes real. Not all of our actions have the potential to cause serious problems. Training you will receive later in self checking will help you to determine when self-checking is necessary. At this point in time, just remember to **think before you act**, particularly if you have any doubts about the consequences of your action.

ASSIGNMENT

1. List the divisions in the Nuclear Business.

2. What are the major departments within the station organisation?

3. Why does the AECB directly licence several supervisory positions within the station?

4. How does the Shift Superintendent/Supervisor monitor work going on in the station to ensure that the operating licence is being observed?

5. Why does the technical section review DRs after the corrective action has been completed?

6. How does self-checking help us avoid actions that could have negative consequences?

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