SPECIALTY CONSTRUCTION

INTRODUCTION

Specialty construction is one of the four construction industry sectors established by the Construction Industry Transitional Regulation of 1988. A sector is a portion of the construction industry defined by the type of construction activity performed.

Section 1(d) of that Regulation defines **specialty construction** as *non-destructive testing work and work in respect of crane rental in the construction industry.*

This policy explains why specialty construction is a separate and distinct sector and describes the trade jurisdictions in each of:

- crane rental work; and
- non-destructive testing work.

WHY A SPECIALTY CONSTRUCTION SECTOR?

Specialty construction is recognized as a separate sector because of several unique factors. Both provide on-site services to other tradespeople, but do not contribute to the actual construction or repair of the structure.

The contractors do not restrict themselves to providing services to general contractors in only one sector (e.g., pipeline contractors). Their employees routinely cross other sector lines when completing their work and regularly perform a mixture of construction and maintenance work. For this reason, it is not feasible to break non-destructive testing or crane rental workforces into discrete bargaining units such as "all non-destructive testing employees in pipeline construction."

Non-destructive testing is quality control work done by specially trained technicians on work done by other trades. Some examples are: pipe welds being tested before being laid in the ground or on the seafloor; vessels being tested for wall thickness; concrete floor slabs being x-rayed for stress cables and electrical conduit prior to cutting and coring. Other trades have produced the products, and non-destructive testing technicians now have to do the testing on their work.

For insurance reasons, the owners and general contractors do not do this quality control work themselves. Non-destructive testing work is done by specialist contractors who often report to the contractor's or owner's engineer rather than to the general contractor. These workers perform work that creates a conflict of interest for them because they perform quality control checks on the work completed by other tradespersons.

As with NDT technicians, crane-rental employees may also work for short times on sites involving other trades, but often have little to do with the overall work in progress.

Finally, because the work crosses construction sectors as well as maintenance work, the contractors and unions, at least in non-destructive testing, have traditionally negotiated one collective agreement that covers both construction and maintenance work. This creates some difficulty in collective bargaining.

In construction, bargaining occurs with a registered employers' organization. In non-construction bargaining, the employers bargain through a voluntary employers' organization. The long-term relationship between the parties has overcome most of these difficulties. The separate sector accommodates this unique bargaining situation.

For these reasons, non-destructive testing and crane rental have been grouped together into a distinct and separate sector.

CRANE RENTAL

What is Crane Rental?

Hoisting equipment is used to lift anything from trees for planting in a person's backyard to boilers and vessels on an industrial site. Individuals or companies that need anything moved or lifted can do this by renting cranes from a crane rental company that specializes in this type of business. A crane rental company can rent out a crane in one of three ways:

- with a crane operator;
- without an operator; and
- on a per-job basis.

The crane rental company runs a "taxi service" providing services to customers on their own premises.

Trade Jurisdictions

Crane operations involve a number of trades: crane operators (also called hoisting equipment operators), mechanics and welders. The Alberta Crane Owners' Association is the registered employers' organization for crane operating and have a collective agreement with the Operating Engineers 955.

Hoisting Equipment Operators

These are experienced operators who have had hundreds of hours working on cranes and other types of hoisting equipment. Apprenticeship programs run from 12 months and not less than 500 hours of operating equipment to 36 months and not less than 1300 hours of operating equipment. In addition, apprentices have to attend classroom training. After successful completion of the apprenticeship, the apprentices receive an Alberta Completion of Apprenticeship Certificate and a Journeyman Certificate of Proficiency for the appropriate type of crane they studied for. Other types of work done on hoisting equipment include:

- **Mechanical Work:** Service and maintenance work needs to be done on cranes regularly. Sometimes the work is done on site, and sometimes done back in the shop. The work is done by mechanics and welders.
- **Yard work:** Yard work includes such tasks as washing of booms and trucks, tidying up the yard, etc. This is mostly done by apprentice operators.

Types Of Cranes

Cranes come in different shapes and sizes, depending on their capacity to lift:

- **Conventional Cranes:** These are cranes with booms, jibs, and other attachments that need to be assembled, usually on site, and are capable of lifting and moving objects of up to 2200 tons depending on the attachments.
- **Hydraulic Cranes:** These are cranes with booms that are extended hydraulically, and do not need assembly. Some new hydraulic cranes are capable of lifting objects up to 1200 tons.
- **Boom Trucks:** Some cranes are mounted on trucks, such as the pitman and the hiab types. These are the smaller cranes capabale of lifting objects of up to 25 tons.

Conventional cranes and hydraulic cranes are normally driven out to the site by truck drivers, who may or may not be unionized. On site, the conventional crane is assembled and set to work. The hydraulic crane is hauled to the site in one piece, and is ready to work as soon as it arrives.

The assembly work (i.e., preparing materials for hoisting and attaching them to the crane) done on site is called **rigging**, and is done by crane operators.

On unionized, multi-trade sites, depending on the objects to be lifted, such as boilers or pipes, other trades may also be involved in the rigging. Otherwise, all rigging is done by the crane operators.

Conventional cranes are disassembled when the work is done, and then transported back the same way they were sent out.

NON-DESTRUCTIVE TESTING

What is Non-Destructive Testing?

Non-destructive testing (NDT) is a very specialized type of work. It involves quality control inspection of pipes, boilers, vessels, etc., before they are put into operation, using sophisticated equipment and techniques to ensure certain stringent government standards are met. Industries utilizing NDT services include those involved in the fabrication, construction and maintenance of:

- pipe mills, pipelines;
- petroleum refineries, chemical and gas plants;
- pulp and paper mills;
- mines;
- airplanes;
- thermo-power generating plants;
- storage tanks and associated facilities; and
- oil and gas bulk plants and terminals.

Non-destructive testing includes radiography, ultrasonics, magnetic particle, dye penetrant and eddy current.

Trade Jurisdictions

Non-destructive testing services are provided by highly skilled, specially trained technicians. In the unionized sector, these technicians are represented exclusively in Alberta by the International Brotherhood of Boilermakers, Local 146 and the United Association of Plumbers and Pipefitters, Local 488 and Local 496, operating as the Quality Control Council of Canada (QCC).

The QCC and the NDT Management Association engage in Canada-wide collective bargaining with local conditions. In Alberta, they are bound by registration. In Alberta, the NDT Management Association is a registered employers' organization representing companies engaged in non-destructive testing.

In the 1960s and early 70s, technicians working on X-rays and other types of testing had no union representation. Because these technicians were working with boilers and pipes most of the time, they went to the Boilermakers Union, and some to the Pipefitters Union, for representation.

In the early 1970s, these two unions in British Columbia got together, and formed the Quality Control Council and came to Alberta shortly after that. A few years later, the NDT Management Association came into being as a national body.

Quality Control Council Members

At present, there are no formal apprenticeship programs for these quality control technicians. A lot of them start out as trainees or general helpers, and go through in-service training with their employers, and taking qualifying examinations as they progress. These examinations all have to meet standards set by the CGSB (Canadian General Standards Board).

Some technicians go through formal training at NAIT or SAIT, where they obtain certifications in a number of specialized fields, such as eddy current or magnetic particle or radiography. An industry training and upgrading fund allows for constant education and upgrading of QCC members.

Radiography

This is the process of making a permanent record on radiographic film of test objects in order to detect defects. It is done by exposing the test object to either electrically generated X-rays or gamma-rays from a radiation source. Radiation from the source passes through the object and is recorded on radiographic film. The film is processed, viewed by qualified technicians who are able to detect defects and anomalies in accordance with applicable codes and standards. This method of testing is used in a number of applications such as:

- weld quality control on pipelines and related facilities, using both internal crawlers and external exposure capabilities;
- material and weld quality control in shop and plant fabrication, for both new construction and maintenance;
- investigation of equipment internals without disassembly;
- corrosion investigation and wall thickness determination in operational piping and vessels using “shadow shots”;
- inspection of concrete floor slabs for stress cables and electrical conduit prior to cutting and coring; and
- radiography of geological cores.

In the pipeline industry, NDT services start at the mill where the pipe is manufactured, and continues through construction and tying-in.

Inspection on pipelines is very specialized in that it covers great distances, is constrained by tight time schedules and requires highly specialized equipment for the large number of welds to be tested. Testing methods most commonly used on pipelines are X-ray and gamma-ray. Internal crawlers are often used, and pipes ranging in size from 6 inches to 48 inches can be serviced.

Ultrasonics

This method uses electrically generated sound waves to penetrate through an object in order to detect defects. Sonic reflection, refraction and absorption are then displayed and recorded on a video

screen for interpretation. This process requires significantly more skill and experience in order to provide accurate interpretations. This method of testing is used in a number of applications such as:

- quality control testing of welds on piping fabrication and installation;
- corrosion surveys on in-service pipelines and/or facilities to develop life histories on equipment;
- quality control on welds and material in vessel, bridge and structural fabrication;
- wall thickness testing in vessels and facilities; and
- quality control on welding of continuous track rail lines.

Magnetic Particle

This method of testing detects surface or slightly sub-surface defects in ferromagnetic materials. Magnetic field is induced into the test object using an electromagnet. A detection medium is then applied which contains magnetic particles that will group around defects that cause irregularities in the magnetic field. The detection media can be wet or dry or even fluorescent.

The process is done either in the field using portable magnetic yokes or in a shop using a magnetic bench. The bench is more efficient for large volumes of work. It is a very simple and cost-efficient process, but is limited to ferromagnetic materials. It is used in a number of applications such as:

- quality assurance inspection of piping fabrication in construction and maintenance in pulp mills;
- inspection of repairs on vessels and fittings;
- inspection of automotive and industrial equipment components for cracks;
- quality control inspection on valve bodies and assorted castings;
- preventative maintenance inspection of gas compressors and related facilities; and
- inspection of critical structural and equipment bolts for cracking.

Dye Penetrant

Liquid penetrant is used to detect surface defects in both ferrous and non-ferrous materials. A penetrating dye is applied to the surface of an object and left for a brief period as capillary action draws it to any surface defects. A developer is then applied and defects can be observed by the technician.

This process is simple, versatile and cost efficient, and can be further enhanced by using bright coloured or fluorescent dyes. The only drawback is that it can only detect surface defects.

This type of inspection is used in the same types of applications as magnetic particle testing, but on non-ferromagnetic materials as well, such as alloys and stainless steel. Other types of applications include:

- annual inspection of lifting tackle for forest fire helicopter gear; and
- quality control of welds on stainless steel components in pipe mills.

Eddy Current

Eddy current testing is the examination of non-magnetic and slightly magnetic tubulars, such as brass, copper and stainless steel, in shell and tube heat exchangers. A probe is sent down the tubes creating a magnetic field. Changes in the fields will indicate common defects such as saddle wear, pitting, transverse cracking, freeze bulges, splits, dents as well as improper workmanship. Other anomalies such as copper plating and magnetic deposits can also be identified. Eddy current testing is used in car plants, refineries, air-conditioning and rivet holes in airplanes.