

E.S. Fox Limited

Fabrication



Cryogenic Cold Box - Interior

COMPANY CONTACT

E.S. Fox Limited — Fabrication

www.esfox.com

905-354-3700 x1360

HEAD OFFICE

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E.S. Fox Limited

CORPORATE OVERVIEW

Since 1934, E.S. Fox Limited (ESFL) has set the standard for safety and quality in the fabrication and construction industry. ESFL is a privately owned, Canadian, multi-trade company, providing a single source for Industrial, Institutional, Commercial, and Power Generation projects. With over 3.0 million direct-hire man-hours last year, we self-perform Structural Steel Fabrication and Erection, Mechanical, Electrical, Sheet Metal, HVAC, Refrigeration, Millwright / Rigging, and Boiler Making.

The strength of our company stems from the vast experience of its people, the integration of a variety of skilled trades, and dedication to total control of construction through computerized planning and monitoring techniques.

ESFL has established a reputation for high quality workmanship, operational flexibility, efficiency, and timely project completion.

CONSTRUCTION CAPABILITIES

As a fully integrated, multi-trade construction firm, E.S. Fox Limited provides clients with a single source solution for their detail engineering, fabrication, construction, and maintenance needs. We are a solutions based provider that delivers a superior level of service from "cradle-to-grave," as we offer multi-trade, service oriented solutions for all your ICI and Power Generation projects.

FABRICATION CAPABILITIES

E.S. Fox Limited is proud to operate three state-of-the-art fabrication facilities across Ontario. At our main fabrication facility in Port Robinson, we offer over 83,000 square feet of production space. We work to the highest standards to produce Pipe Spools, Modules, Cryogenic Cold Boxes, and Pressure Vessels. With over 800 weld procedures and 40 quality certifications including nuclear, E.S. Fox Limited continues to be a leader and a symbol of Canadian strength and tradition in the supply of Quality Fabrication Services for the Industrial, Commercial, Institutional, and Power Generation markets for over eight decades.



Founder - Edward (Ted) Fox

SERVICES

- ENGINEERING
- FABRICATION
- STRUCTURAL DESIGN
- STRUCTURAL STEEL ERECTION
- BRIDGE ERECTION
- MILLWRIGHTING | RIGGING
- BOILERMAKING
- MECHANICAL
- ELECTRICAL
- SHEET METAL
- REFRIGERATION
- HVAC

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Environmental Health and Safety

SAFETY CULTURE

At ESFL, employee safety, protection of the environment, and work quality are the main focus of our safety culture. Both management and employees work together in an effort to further advance knowledge of safety and incident prevention. Together we work to ensure a safe work environment for all. Our employees believe in the fundamental principle that safety is everyone's responsibility.

One of our core values is to "Prevent the Event." Incident prevention is the integral part of every job with the safety and well-being of each individual the number one priority.

SAFETY PROGRAM KEY ELEMENTS

- Corporate Safety Manual
- Site Specific Safety Plans
- Orientation and Training
- Incident Investigation
- Lessons Learned Bulletins
- Job Safety Analysis
- Workplace Inspections
- Senior Management Review
- Safety First Attitude
- Trending and Analysis
- Setting Objectives and Targets
- Safety Workshops
- Mentoring Program
- J.H.S.C.
- Strong Communication
- Accountable Supervision
- Safety Meetings



International
Organization for
Standardization

ISO 45001:2018

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Quality Assurance



ISO	CSA	ASME
<ul style="list-style-type: none"> • ISO 9001:2015 • ISO 14001 • ISO 18001 	<ul style="list-style-type: none"> • CSA N285.0 Nuclear Class 1,2,3, & 4 Parts, Components & Support (Shop & Field) • CSA N285.0 Nuclear Material Supply Ferrous and Non-Ferrous (3 Locations) • CSA N286-12 Nuclear • CSA N299.1 – 2016 • CSA B51 Boiler, Pressure Vessels & Pressure Piping & Repairs (Shop & Field) • CSA B51 Category A, B, C, E & H Type Welded Non-Welded Fittings (Shop & Field) • CSA B51 Hot Tap & Line Stopping (Shop & Field) • CSA Z7396. 1-17 Medical Gas Pipeline Systems Part 1 	<ul style="list-style-type: none"> • National Board Registration for ASME Section III, R, VIII (Shop & Field) • ASME Section III, Division 1: N, NPT, NA, NS • ASME Section VIII, Division 1 & 2 Pressure Vessels (Shop & Field) • ASME U, U2, S, & PP Stamps (Shop & Field) • ASME U, UM Stamps: Edmonton Division (Shop & Field) • ASME B31.1 Power Piping (Shop & Field) • ASME B31.3 Process Piping (Shop & Field) • ASME B31.5 Refrigeration Piping (Shop & Field) • CSA B52 Mechanical Refrigeration Code
CWB		
Structural Steel CWB W47.1 Div. 1 Structural Aluminum CWB W47.2 Div. 1		



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Locations & Facilities

Head Office: Niagara Falls, ON —240,000 square feet

Branch Location	Capabilities		Square Footage
Darlington, ON	Construction		
Hamilton, ON	Construction	Fabrication	3,000 sq. ft.
Kingston, ON	Construction	Fabrication	17,000 sq. ft.
Port Robinson, ON		Fabrication	83,000 sq. ft.
Sudbury, ON	Construction		
Thunder Bay, ON	Construction	Fabrication	5,000 sq. ft.
Tiverton (Kincardine), ON	Construction		
Vaughan (Toronto), ON	Construction		
Oshawa, ON	Construction		
		Total Fabrication	108,000 sq. ft.



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Capabilities

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We provide the following construction services:

- ◆ Piping
- ◆ Electrical
- ◆ Structural Steel
- ◆ Ironworkers
- ◆ Millwrights
- ◆ Boiler Making
- ◆ Sheet Metal
- ◆ HVAC
- ◆ Instrumentation & Controls
- ◆ Operating Engineering
- ◆ Insulation
- ◆ Carpenters
- ◆ Labourers
- ◆ Refrigeration



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Capabilities

FABRICATION CAPABILITIES

At our main fabrication facility in Port Robinson, Ontario, we offer over 83,000 square feet of production space. We work to the highest standards required to produce Cryogenic Cold Boxes, Pipe Spools, Modules, and Pressure Vessels. With more than 800 weld procedures, we fabricate:

Modules and Vessels

- ◆ Process Modules and Equipment Skids
- ◆ Cryogenic Air Distillation Columns for:
Oxygen, Nitrogen, and Argon
- ◆ Air Liquefaction / Separation
- ◆ Hydrogen Purification
- ◆ Catalyst Reclamation
- ◆ Oil/Water Purification

Pipe Fabrication

- ◆ Stand alone contracts & support of field projects and other fabrication projects
- ◆ Area of expertise is high alloy materials:
Stainless Steel, Aluminum, Titanium,
Chrome-Moly
- ◆ Carbon Steel up to 84" Diameter
- ◆ Victaulic—Roll Grooved Piping up to 48" Dia.
- ◆ Jacketed Pipe



Pressure Vessel



Cryogenic Cold Box

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Capabilities

PORT ROBINSON SHIPPING

We are unique in that we have access to the Welland Canal at our Port Robinson facility. This includes our own loading dock, where we can ship oversized modules from up to 800 tons to any water accessible location in the world.

Transportation Access & Dock Facilities

- ◆ 1/2 mile from Highway 406 extension providing direct access to Queen Elizabeth Highway
- ◆ 1/4 mile from Canadian National Railroad line
- ◆ Heavy Barge Roll On/Roll Off Loading Dock extending into the Welland Ship Canal turning basin providing 10' draught and 400 ton capacity
- ◆ Heavy Lift Dock of 800 ton capacity, dock face 475 ft. draught 25 ft. The dock can accommodate maximum Seaway length vessels
- ◆ The site incorporates 5 acres of level, well compacted, crushed stone assembly area



Cryogenic Cold Box - Port Robinson Loading Dock

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Fabrication Capabilities

MODULE FABRICATION

Our skilled multi-trade workforce fabricates modules in a controlled shop environment resulting in outstanding levels of quality. By integrating our construction and fabrication expertise, we have the unique capability to supply, fabricate, and test process modules before they shipped.

Our work often involves the construction of heavy oil facilities, oil sands development, gas plants, power stations and a host of other heavy-industrial projects, including those that require stringent "clean-room" conditions.



Cryogenic Cold Box - In Production

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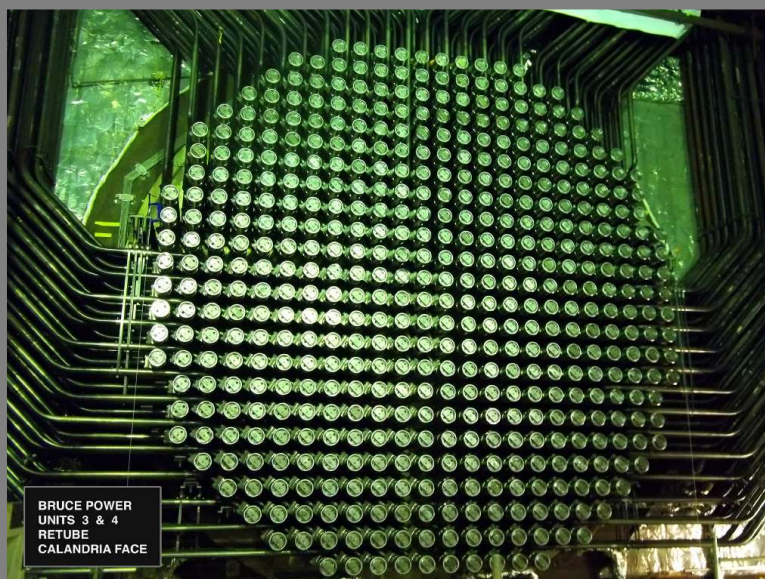
Fabrication Capabilities

NUCLEAR FABRICATION

At ESFL, we provide a fully-integrated, single source of engineering, fabrication, construction, and maintenance for all nuclear markets. We have manufactured numerous nuclear components for projects in Canada, China, Romania, and Korea. We also hold ASME Nuclear Certifications N, NPT, NA, and NS, allowing us to provide fabrication services to the international market.

Examples of our Nuclear Fabrication:

- Pressure Vessels
- Spent Fuel Storage Modules
- Low Level Waste Containers
- Feeder Tubes



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Fabrication Capabilities

CRYOGENIC FABRICATION

As one of our specialties, ESFL regularly manufactures Cryogenic Cold Boxes for air separation plants. These plants operate at temperatures below -200 degrees F; aluminum and stainless steel are used for vessels, piping, and instrumentation systems.

Special materials, highly specialized welding techniques, documented quality control, and meticulous attention to detail are mandatory since the units cannot be maintained or repaired while operating. By utilizing a "clean room" bay, ESFL is able to control ambient factors when fabricating components such as aluminum pipe spools.

ESFL has manufactured numerous Cryogenic Cold Boxes for air separation process plants, chemical plants, refineries, and power generation plants.



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Fabrication Capabilities

PIPING, PROCESS, AND EQUIPMENT SKIDS

In general, fabrication of piping, process skids, and equipment skids (racks) in a controlled shop environment, uninterrupted by climatic conditions, results in higher quality, shorter delivery times, reduced costs, and a mitigation of risk inherent with field construction.

ESFL offers custom integrated process skid fabrication to create mechanical and electrical skid mounted process systems that are pre-wired and mounted on a common base to meet your specific design and process requirements.

ESFL has two facilities for pipe and equipment skid fabrication: Port Robinson, and Kingston, Ontario. Both are UA shops and have fabricated racks and skids of varying sizes and dimensions for destinations in North America and throughout the world.



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Fabrication Capabilities

PORT ROBINSON: MAIN BUILDING DIMENSIONS

South Bay: 380ft. Long x 75ft. Wide x 50ft. High, giving 28,500 sq. ft., (Qty. 5) Overhead Cranes Each having 25 Ton and 5 Ton Capacity.

North Bay: 210ft. Long x 75ft. Wide x 50ft. High, giving 15,750 sq. ft., (Qty. 2) Overhead Cranes Each having 25 Ton and 5 Ton Capacity.

Clean Bay: 170ft. Long x 75ft. Wide x 50ft. High, giving 12,750 sq. ft., (Qty 1) 25 Ton Overhead Crane with 5 Ton Capacity.

Production Bay: 130ft. Long x 30ft. Wide x 20ft. High, giving 4,000 sq. ft. nuclear production fabrication for customer supplied material.



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UIG Cryogenic A-500 Cold Box

Client

Universal Industrial Gases Inc.

Scope

- Dimensions: 159'0" (L) x 28'-9" (W) x 15'-4" (H); Weight: Approx 500,000 Lbs
- End User: NUCOR Gallatin Steel (Ghent, Kentucky)
- Use: Supplies Oxygen to Steel Mill
- Other Uses: Nitrogen and Argon sold as by-products
- Transport: Shipped via laker barge from Port Robinson to site and transported under hook on NUCOR access road

Trades

- Production Workers | Vessel Workers

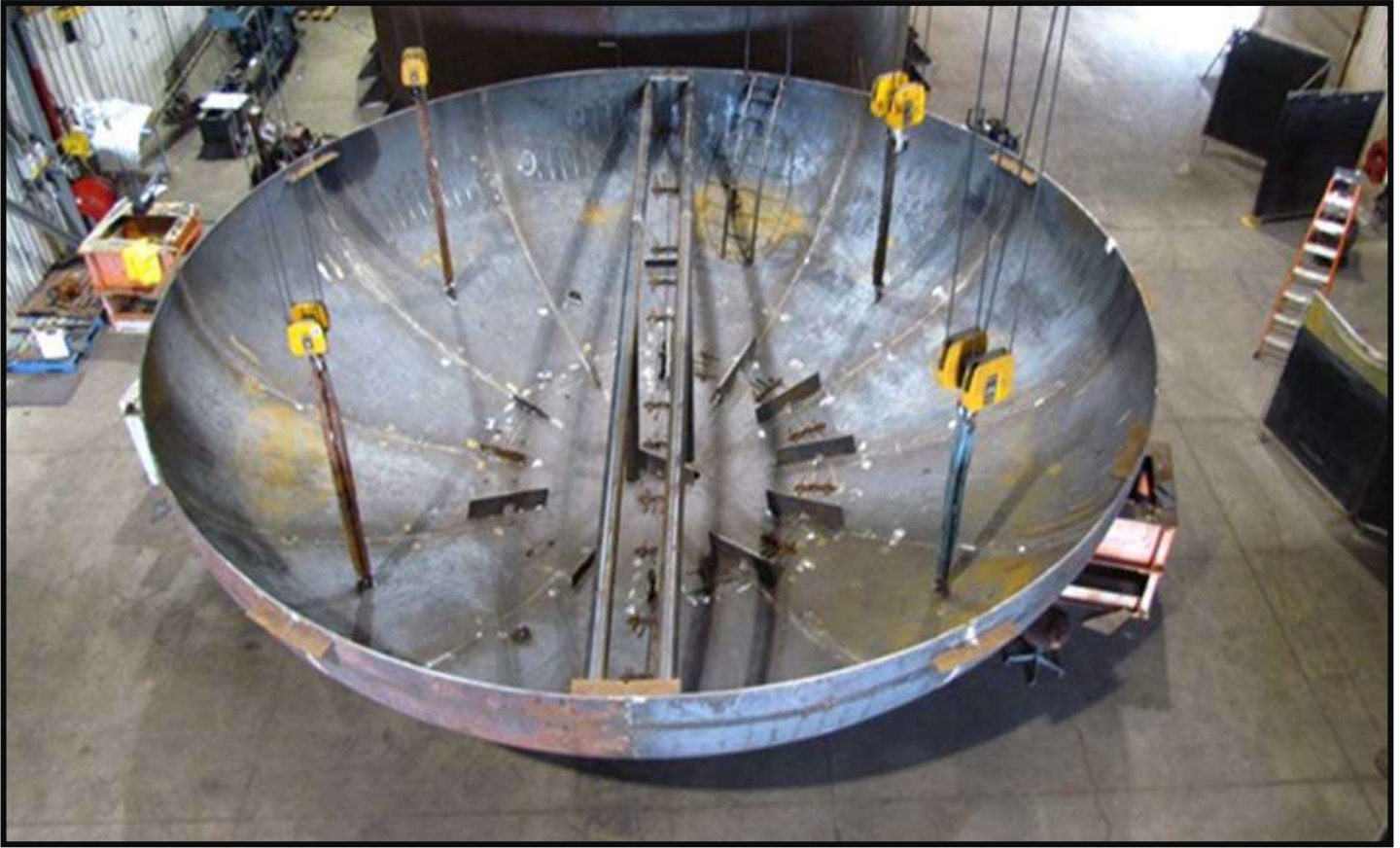
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Reactor and Regenerator Vessel Components

Client

Imperial Oil

Scope

- Mechanical design of the vessel including site lifting lugs for completed vessel and FEA analysis of the vessel to confirm vessel deflections
- Design of suitable lifting arrangement and stiffening details to permit installation of refractory lining prior to installation of the base of the existing vessel
- Detailing and supply of platform, ladder clips, and other supports
- Fabrication of top heads from multiple head segments, and dual metal top head nozzles
- Trial fit-up, blasting, painting, and co-ordination of transportation to Nanticoke site

Trades

- Production Workers | Vessel Workers

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Reactivator Overhead Accumulator Vessel

Client	Shell Canada
Scope	<ul style="list-style-type: none">• 3'-0" Inside Diameter• Material of Construction—SA-516-70N Carbon Steel• Vessel was PWHT• Delivered to Corunna, Ontario• Operated in Sour Wet H₂S Service• Shipping Weight—3,986 Lbs
Trades	<ul style="list-style-type: none">• Production Workers Vessel Workers

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MPTP—TDO 1&2

Client

Ontario Power Generation

Scope

- Code of Construction of Outer Package—ASME Section VIII Div. 1
- Used for Transportation of Tritiated Heavy Water via Containment Vessel Inside Outer Package from Nuclear Generating Stations to Western Waste Facility
- Material of Construction—SA-240-304L (Outer Package)
- Material of Construction—SA-240-304L Section III Nuclear Grade Material (Containment Vessel)
- Outer Package Container was of Double Wall Construction and filled with High Density Foam (General Plastics Inc.) for Crash Protection
- Units were permanently mounted to OPG supplied trailer with custom-machined Turnbuckle assembly

Trades

Production Workers

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Bruce A — Standby Generators Fuel Skid Fabrication

Client

Kinetrics Inc.

Scope

- Fabrication of fuel skid structural frame, ladders, & walking platforms to CSA W59 -13
- Component machining
- Pressure boundary welding of stainless steel piping to ASME B31.1
- Assembly, mounting, & connecting of pumps, instrumentation, meters, and various specialty devices
- On-skid electrical power & instrumentation wiring
- Painting & finishing
- Materials supply & procurement to N299.4 standard
- Quality Assurance & inspections to N299.3 standard
- NDE inspections

Trades

Production | Iron Workers

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Water Treatment for SAGD

Client

GE Power and Water

Scope

- Supply of all materials, labour, and equipment to fabricate and erect
- Seven piping and process modules for the Sunshine Oil Sands
- Steam Assisted Gravity Drainage (SAGD) development
- Fabrication of structural frames
- Procured, fabricated, and installed all process piping systems
- Insulation & Electrical Heat Tracing
- The majority of the piping was stainless steel

Trades

Ironworkers | Pipefitters | Electricians

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U.O.P Des Plaines, Illinois

Client

Burnco Manufacturing Inc

Scope

- Fabricated and shipped two modules for the Irving Oil Refinery in Saint John, NB
- Supply & fabricate eight interconnecting Process Modules for a Continuous Catalyst Regeneration Unit
- Electrical power instrumentation wiring and tubing
- Handling of customer supplied equipment and material in addition to ESFL supplied equipment and material
- Tagging and documentation of all parts
- Material and equipment load onto ocean-going vessel “M.V. Project Americas”

Trades

Pipe Fitters | Electricians | Steel Workers

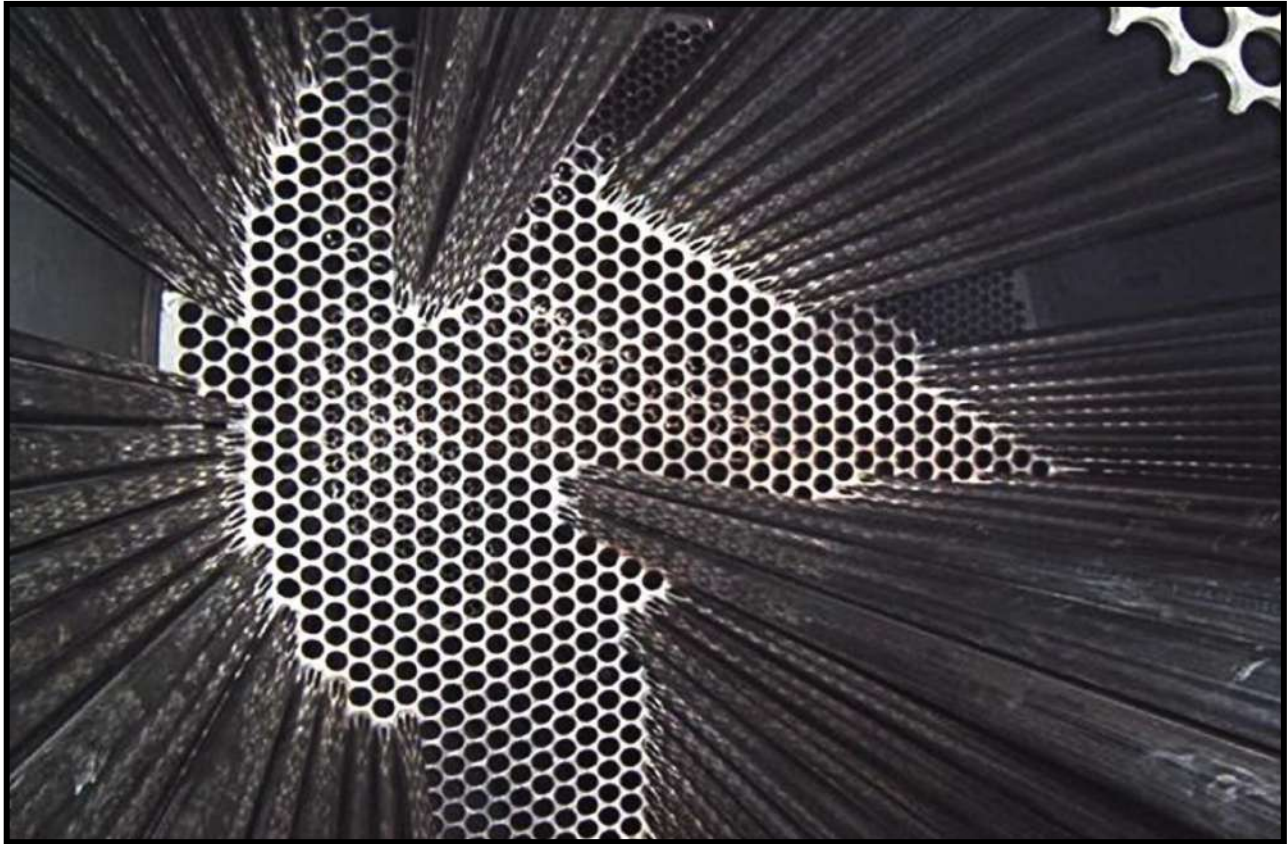
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Falling Film Evaporators

Client	Black Rock Engineering
Scope	<ul style="list-style-type: none">• Fabricated in sections at Port Robinson shop• Shipped to Nisku, AB for off-site assembly• Transported to Cold Lak, AB site as complete units for immediate installation
Trades	Vessel Workers Production Workers

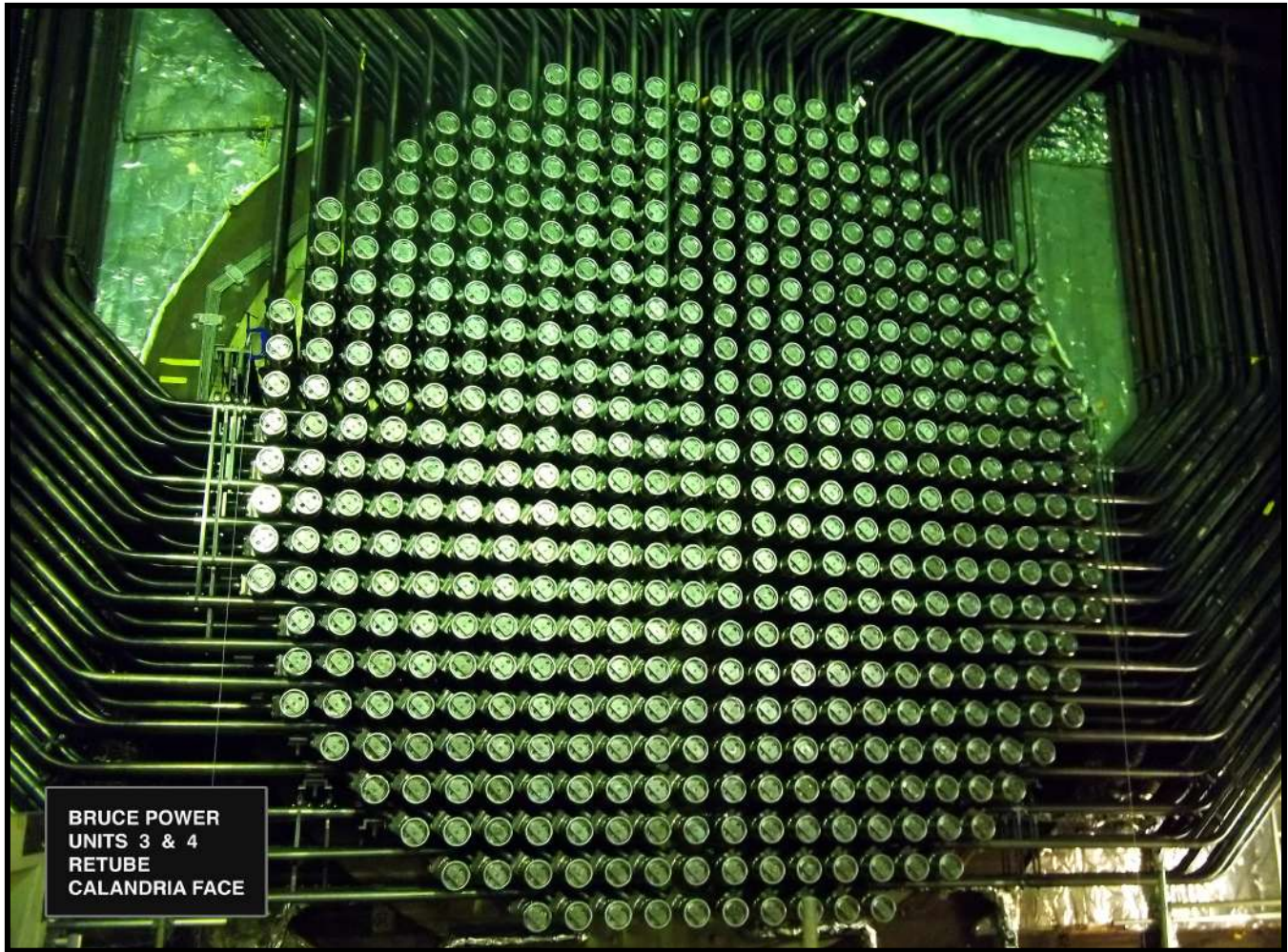
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Bruce Power Restart—Feeder Tube Retube Project

Client	Bruce Power LP
Scope	<ul style="list-style-type: none">• Fabricated and installed 1,920 replacement feeder tube sections for Bruce Units 1&2• Utilized all bent feeders as opposed to welded elbow
Trades	Pipe Fitters Steel Workers

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