THE SANDHOUSE

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THE SANDHOUSE

THIS JOURNAL IS THE OFFICIAL PUBLICATION OF THE
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Press Date — November 29, 2013

Front cover: *SW1200RSu switcher CP 1238 works up the 2% grade to the West 16th Avenue crossing on CP's Arbutus Line on the west side of Vancouver, heading north with two hoppers destined for the Molson brewery at the end of the line. The date is May 8, 1991. (Photo by Eric L. Johnson)*

Back cover: *Sister locomotive CP 1237 works a similar duty on July 25, 1991, as it crosses West Fourth Avenue at Mile 0.51, just a few blocks from its destination at the top end of the line. (Photo by Eric L. Johnson)*

To Our Readers

This issue reflects the dual focus of The Sandhouse – to explore B.C.'s railway history and to document the current events that will shape the future of rail in this province.

Our look back starts with a photo feature by Eric Johnson that portrays the last decade of a unique urban rail operation through Vancouver's affluent west side – the Arbutus Line – which saw service for almost 100 years.

Then Patrick Hind describes in detail the pioneering of remote-control operation of heavy-haul mainline trains by Canadian Pacific, based on extensive notes shared with him by a CP official closely involved in that development.
Next, David Meridew takes us to the roof-top of a Vancouver business that was strategically located for photography of railway sites in all directions, and David took full advantage of this on two occasions 30 years ago.

Our features conclude with a look into the future, as the Evergreen Line extension of SkyTrain takes concrete shape and makes its mark on Coquitlam and Port Moody.

As the year draws to a close, I wish PCD members and all other readers a Merry Christmas and a Happy New Year.

Ian Smith,
Editor

Correction

The first training runs of ex-BCER interurban car 1225 on Southern Railway of B.C.'s mainline for Fraser Valley Heritage Railway crews took place on June 9, not June 8 as stated in the previous issue on page 20 and in captions on pages 21, 22 and 23.

Dates to Remember

December 7 -- A Lantern Affair, Christmas Event, Heritage Square, Coquitlam, 16:30-19:30
(Fraser Mills Station Museum will be open)

December 15 — PCD Christmas Get-Together, Fraser Mills Station Museum, Coquitlam, 14:00-16:00

January 16, 2014 — PCD Meeting, Place des Arts, Coquitlam, 19:15. (Entertainment TBA)

February 20 — PCD Meeting, Place des Arts, Coquitlam, 19:15. (Entertainment TBA)

March 20 — PCD Meeting, Place des Arts, Coquitlam, 19:15. (Entertainment TBA)

Division News

The Division's autumn season of entertainment began with the September 19 meeting, featuring a DVD presented by Ron Keillor, covering the history of Newfoundland's 42-inch narrow-gauge line.

Our October 17 meeting was treated to another selection from Ron's video library -- one titled Warehouse on Wheels: Operation of a Rail Yard, filmed in 1986 at CP Rail's Alyth yard in Calgary. This was followed by some short films from a British DVD titled Steam Under Strain.

The final meeting of the season, on November 21, was the occasion for two digital slide shows. Ian Smith presented "In Pursuit of the Black Widow," focusing on an ex-VIA F-unit now operating on a shortline in eastern Washington in Southern Pacific's 1950s livery. Chris Wasney showed images from a recent trip to CPR's Kicking Horse Pass and vicinity.

Ron Keillor and Ian Smith manned Fraser Mills Station Museum on September 28 during an open house event at Heritage Square, and will do so again on December 7 during the annual Lighten Up event, from 16:30 to 19:30.

We'll close out the year with the annual Christmas Get-Together, this time on Sunday, December 15, from 14:00 to 16:00. Join fellow members for informal entertainment and light refreshments.

A small tracked excavator breaks up the asphalt in front of the Division's ex-CP caboose on October 7, to remove thick tree roots that had broken through the pavement. The area has since been repaved. *(Photo courtesy of Stanley Quek)*

YEARS AGO IN THE SANDHOUSE

35 Years Ago (October 1978 issue)

— CN and the United Transportation Union agree to reduce crews to three men.

30 Years Ago (October 1983 issue)

— BC Rail will take over the Roberts Bank line from the B.C. Harbours Board Railway.

25 Years Ago (September 1988 issue)

— CN starts removing track from the Cowichan Subdivision on Vancouver Island.

20 Years Ago (September 1993 issue)

— Two ex-Toronto PCC cars are scrapped in Richmond after restoration plans fail.

15 Years Ago (September 1998 issue)

— CP Hudson 2816 arrives in North Vancouver for restoration, if feasible.

10 Years Ago (Autumn 2003 issue)

— CP Hudson 2816 returns to North Vancouver for maintenance over winter.

— CN is the winning bidder for BC Rail's freight operations, according to media leaks.

— The former Kettle Valley Railway trestles in Myra Canyon are incinerated by wildfire.

5 Years Ago (Autumn 2008 issue)

— After a busy summer in B.C. for CP Hudson 2816, reports say it will not operate in 2009.

— The first BC Rail unit to be repainted in CN livery is C40-8M locomotive BCOL 4615.

— CP says it will demolish the former Nelson Shops in the coming year.

— VIPs ride the Canada Line on Sea Island on Nov. 12, with public service to start late in 2009.

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The Arbutus Line's last decade captured on film

by Eric L. Johnson

As a resident of Kerrisdale, I had the good fortune to observe a dying vestige of urban railroading in the City of Vancouver, in the final decade of operations on Canadian Pacific Railway's so-called Arbutus Line. Living quite close to the line gave me many opportunities to photograph the little local switch job, all that remained of what once had been a busy interurban operation.

With Vancouver's increasingly busy road traffic, photography could be a challenge. But I'm glad I made the effort because the weekday switcher would vanish altogether in 2001, as the line's final customer, Molson Brewery, opted to receive its shipments of malted barley by hopper trucks from a rail connection on the city's waterfront.

The final train to serve Molson's on June 1, 2001, marked the end of 99 years of rail traffic on the line. Created by the Canadian Pacific Railway in 1902, the line was leased by the British Columbia Electric Railway and its successor, the British Columbia Hydro Railway, from 1905 until 1985, when the line reverted to CPR. The BCER era encompassed an intensive interurban service into the 1950s.

The Arbutus Line, as it was popularly known, was not an official name, and almost from the beginning that referred only to the portion of the Vancouver-Steveston line that lay between Vancouver and Marpole, where -- after 1909 -- the junction with the New Westminster line was created. The Arbutus Line was thus, towards the end, only a part of BCER's Vancouver Subdivision, and the CPR's Marpole Spur.

When built, the line roughly paralleled Arbutus Street from West 8th Avenue south to the Fraser River, although the renaming of streets around 1910 meant West Boulevard replaced Arbutus Street from West 37th Avenue to about West 61st Avenue, and Arbutus Street no longer existed south of there.

So, in spite of the roughly 2.15 miles of track parallel to Arbutus Street, a greater portion, about 2.7 miles, ran parallel to West Boulevard. Calling the track the Arbutus Line is acceptable, although that name was never used by CPR, or by B.C. Electric and its offspring.

As can be seen from the grade profile, the line rose about 200 ft. in elevation, from the end points just above Fraser River and False Creek water levels to the summit at West 41st Avenue. The steepest grade, 3%, lay for three blocks paralleling West 6th Avenue west of Burrard Street, where the mainly north-south line briefly ran on an east-west alignment.

The picturesque sag between West 16th and West 25th Avenues, perhaps the most frequently photographed spot on the line, featured a grade of 2% to 2.5%.

In 1982, the connection with downtown Vancouver was severed with the removal of the bridge over False Creek, resulting in Mile 0.0 being pegged at a point near the south end of the Burrard Street bridge. Mile 6.26, the south end of the Arbutus Line, was at Steveston Junction.

In the beginning, there was very little developed property along the line, but by 2001 growth of the city of Vancouver had created continuous

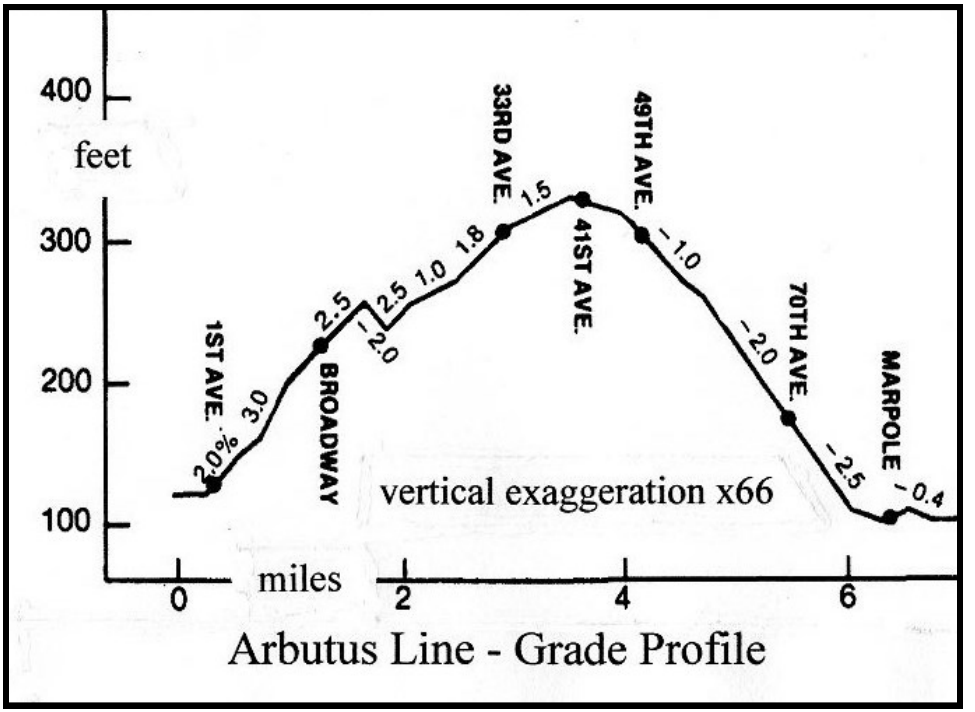
residential and commercial development along the six miles of track. Much of that was housing for an affluent upper middle-class in one of Canada's most expensive cities, making the line even more of an anomaly – how often do railways penetrate the neighbourhoods of the executive class?

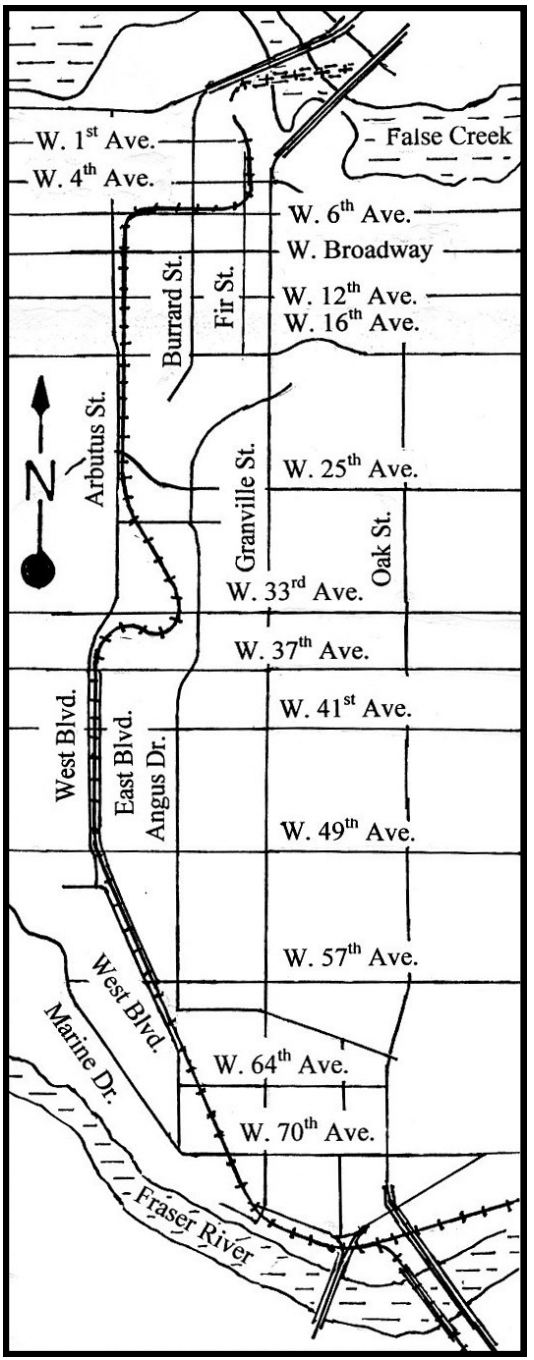
As late as the 1980s, an industrial area between West 11th and West 12th Avenues, to the west of Arbutus Street, had given the line substantial business, including traffic to and from the Carling brewery. But in 1997 the last customer there, a plastic bag manufacturer named Twin-Pack, was pushed out and the spur across Arbutus Street was lifted. (The whole former industrial area today is occupied by apartment blocks and trendy shops.) That left only one customer on the six-mile line: Molson's Brewery.

Revenue operations during the final decade were handled exclusively by Electro-Motive end-cab switchers of the SW1200RS type, mostly those that had been rebuilt during the 1980s. Standard procedure was to run hood-forward northbound, and cab-forward southbound.

Even in the 1990s, "chasing" the once-a-day Molson switcher could be a frustrating experience with ever-increasing street traffic -- what would it be like today? In the final decade, operations on the line were always Mondays to Fridays, but shifts were changed several times: afternoon shift from 1991 to February 1992; late morning shift until about August 1993; afternoon shift to about 1997; and late morning shift to the end in June 2001.

Since most railfans worked days, and with regular daylight hours of 07:30 to 15:30, it was difficult for them to get morning photos. Afternoon photographic opportunities were not as good as in late mornings because of the heavier street





traffic. It was frustrating to sit in one's car at plugged intersections, watching the switcher roll by uninterrupted. Once under way, the trains never stopped, running between 10 and 15 miles per hour, while stop-and-go auto traffic offered the chaser no better overall speed.

There were several dozen good, accessible, shooting locations, as the switcher passed through 17 traffic-light-controlled intersections and 10 or so stop/cross-buck intersections, keeping the train crew ever alert. Backgrounds generally featured much of the Lower Mainland's famed greenery -- and traffic never to be seen in Vancouver again.

Here, then, is a pictorial record of the last decade of operations on the Arbutus Line.

FURTHER READING

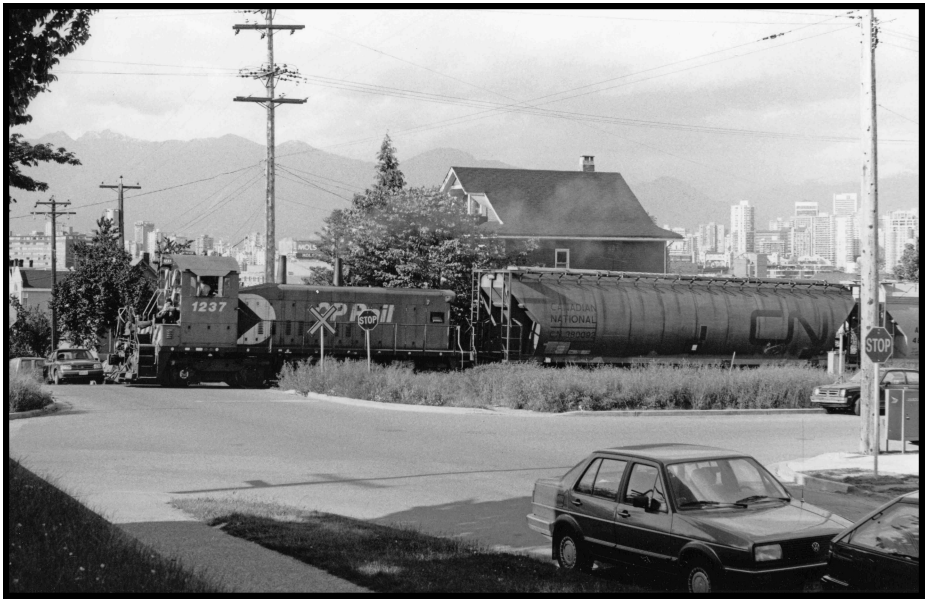
"CPR's Arbutus Line: 10 years after", The Sandhouse, Spring 2011, pp. 28-29.

Smith, Ian. "Arbutus Line operations end with last run to Molson's", The Sandhouse, June 2001, pp. 9-14.

Smith, Ian . "Last trains to Molson's mark end of CPR's Arbutus Line", Branchline, July-August 2001, pp. 8-9.

Smith, Ian. "With the trains gone, a ferro-garden emerges", The Sandhouse, Winter 2009/10, pp. 30-32.

The clock atop Molson's brewery reads 4:51, indicating this is an afternoon job, with CP 1237 seen at West First Avenue crossing, Mile 0.28 of the Marpole Spur on June 4, 1992, after running around its train to start switching. Local residents have since occupied this site with a communal garden. Below, the same train had crossed busy West Fourth Avenue, coming north 10 minutes earlier, with the locomotive running nose first, pulling two loaded hoppers. (All photos by Eric L. Johnson)



Running southbound, CP 1237 charges up the 3% grade along West Sixth Avenue, crossing Cypress Street, on June 2, 1991, with the Vancouver skyline in the distance. Below, the same unit is seen northbound on May 22, 1991, at West 11th Street on the original southbound BCER track. In the near foreground is a block-long siding, with a switch to the Twin-Pack plastics plant spur at right.

About to cross West 25th Avenue, running southbound, CP 1237 has just charged up a 2.5% grade after descending a 2% slope from West 16th Avenue, on July 27, 1992, with parallel Arbutus Street to the left. Below, 1237 climbs a 1.5% grade, after crossing West 33rd Avenue on June 1, 1992 on its way south, as it wends its way past houses on the city's affluent west side. No "wrong side of the tracks" here!

CP 1237 with caboose in tow descends the 1.5% grade just 100 feet west of the spot shown in the previous photo on page 11, on July 27, 1992. Below, the same engine reaches the line's summit as it crosses West 41st Avenue at West Boulevard on its way south on June 2, 1991, beneath a "cat's cradle" of trolleybus wires and power lines. The McDonald's outlet at right sits on the site of a former BCER loop.

CP 1237 trundles south on March 29, 1994, running alongside West Boulevard as it nears a switch for Kerrisdale siding at about West 44th Avenue. Below, sitting in that siding on August 26, 1966, while its crew has a meal at McDonald's, is CP 8115. To the author's knowledge, this was the only unrebuilt SW1200RS locomotive to operate on the Arbutus line.

How CP pioneered remote-control operation in Canada

by Patrick O. Hind

In today's world of mainline trains with remotely-controlled locomotives positioned at different points throughout the train, one may wonder when this concept originated.

The idea was formed in the United States shortly after diesel locomotives became the main type of motive power on the mainline railways. It was soon seen that, with the ability to operate a train with multiple diesel units controlled by one engineer, trains could become longer, with tonnage ratings far exceeding those of the steam era.

In the age of steam, each locomotive required a separate two-man crew of engineer and fireman. Thus, a heavy train with multiple locomotives would require costly extra manpower to operate, as well as needing to stop for water and fuel at regular intervals, which would take longer with additional engines.

Also, it was very seldom that a steam locomotive worked through more than two or three subdivisions before another engine took its place. In contrast, diesel locomotives could run through many subdivisions with little need for servicing and in most cases would operate for an entire run.

So diesel locomotion offered the railways many advantages over steam in cost-efficiency, with lower manpower requirements, less frequent servicing and more efficient fleet utilization.

With these benefits already provided by multiple-unit diesel operation at the head of the train, the next big advance was to place more diesel locomotives elsewhere in the train, but still controlled by the engineer in the leading unit.

After being pioneered in the Unites States, testing of this concept in Canada by the Canadian Pacific Railway began in the late 1960s, less than a decade after CP had operated its last steam locomotive in regular service in 1960.

The impetus for the testing of "robot" operation, as it was then known, came from the prospect of a substantial expansion of export coal traffic from the mines in southeastern British Columbia. The booming Japanese steel mills needed vast supplies of metallurgical coal, and the B.C. mines had the capacity to supply it, providing the commodity could be shipped cost-effectively to a west coast seaport.

Japanese and Canadian industry, including CP, put considerable effort into examining how to produce and transport the commodity. CP's interest was readily apparent, owing to the proximity of the desired coal supplies to its existing rail line in the Crowsnest region around Sparwood, B.C., which would not require too much additional trackage to access.

The Japanese industrialists wanted to purchase several million tons of coal per year, initially for a period of 15 years, so it is not difficult to the envision the magnitude of such an operation. If the project went ahead, it would mean a marked increase in rail traffic, and provide widespread economic benefits to the region. To make this happen, the Japanese buyers expected considerable restructuring of the applicable freight rates, which, of course, would have to be mutually agreeable to all concerned.

CP understood that a complete upgrading of its transportation procedures over the proposed route

would have to be undertaken, and it therefore proposed a plan consisting of the following elements:

-- complete implementation of an extensive "in-plant" system of computerization for the project;

-- much more advanced motive power and related equipment;

-- re-designed coal-carrying cars;

-- an effective radio communications system;

-- Centralized Traffic Control;

-- upgraded track and structures at strategic locations along the route; and

-- establishment of manpower and servicing facilities along the route.

All levels of CP's personnel would be either directly or indirectly connected with this unprecedented undertaking, which would effectively contribute to its ultimate success. Top priority had to be given for adequate lead time, to allow for the controlled development and efficient operation of equipment at the mining and loading sites. The same applied to developing the desired route, and to constructing a rail terminal and deep-sea facilities on the west coast.

Roberts Bank was ultimately chosen as the site of the deep-sea port, and the task of building the coal terminal there was to be undertaken by Westshore Terminals.

Initial projections were that coal would be hauled in 104-car unit trains, employing remotely controlled locomotives over almost all of the 1,400-mile round trip from Sparwood to Roberts Bank and return. Plans also called for the use of a manually-controlled "pusher" set of diesels units on the 2.2% compensated ascending grade from Beavermouth to Stoney Creek in the Selkirk Mountains, a distance of 14.1 miles.

The westward unit trains of 104 cars, each weighing 131.5 tons loaded, would be handled by four 3,000-hp locomotives from Elkview, at the end of a 1.2-mile spur from the Cranbrook Subdivision at Sparwood, to Golden, located 35 miles west of Field on the Mountain Subdivision. These units would be coupled in multiple at the head-end of the train. This conventional configuration was decided upon because of the predominately downhill profile of the grade from Sparwood to Colvalli, followed by a nearly level grade along the Kootenay and Columbia Rivers from Colvalli to Golden.

At Golden, a four-unit, 12,000-hp lash-up, equipped with "master" remote control apparatus, would replace the four units that had brought the train from Sparwood. Then, about 40 cars back in the train, a multiple-unit set of remote locomotives would be inserted into the train, along with a "control car" (or " robot car", as they were then known). The robot car would contain the remote radio transceivers, logic and interface equipment designed to convert radio signals from the master into electrical and pneumatic impulses, which were to be fed into the train-line circuits to control the power and braking functions of the remote locomotives.

Then, at Beavermouth, 28 miles west of Golden, a multiple-unit set of 3,000-hp "pusher" units manually controlled by their own crew would be added 40 cars behind the remotes and about 24 cars ahead of the caboose.
In this modern age, there would be radio communications between the head-end crew on the master locomotives, the crew on the pusher set, and the train conductor in the caboose. In steam days, communication between these separated crews when starting the train would have been by whistle or hand signals.

The robot cars were converted from old cabless B-unit locomotive car-bodies and express cars, which CP sourced from its own diesel fleet or purchased from other railways. The B-units were stripped of their engines, generators and traction motors and essentially became a shell on wheels. Then they

were fitted with the necessary radio reception equipment, as were the former express cars.

These vehicles were coupled directly to the remote locomotives, either ahead of or behind them. When the engineer in the leading (master) unit performed any operational function, a radio signal was transmitted to the robot car, which passed the command to the remote units, and the remotes would respond instantly.

This unique master and remote system was known as "LOCOTROL" and was produced by Harris Controls in Melbourne, Florida, which had acquired the technology from its inventor, an Ohio telephone and electronics manufacturer named North Electric Co. (Today, the system is owned by General Electric Transportation Systems, and has been installed on more than 8,500 locomotives worldwide.)

However, as with most anything else new, there were many bugs in the system but through close liaison with the manufacturer these kinks were gradually ironed out. CP's mechanical personnel at Coquitlam and Calgary maintained an extremely high level of performance from the Locotrol equipment, not only in the teething years but over the many years since.
In preparation for remote-control operations, CP carried out a rigorous testing program. This started with trains of 9,000 tons and gradually increased to 12,000, 13,200, and 14,200 tons. At the last stage, the test train required 13 3,000-hp units to work up Beaver Hill.

Quite early in the tests, it was thought that the master and remote locomotives and their respective trailing cars would be regarded as two trains coupled "nose-to-tail", thus allowing each locomotive set to handle behind it as much tonnage as it would in a conventional operation.

However, it was soon found out that this allocation of power, coupled with the variations in grade profile, resulted in trains breaking in two, either from the sheer weight of the train pulling the train apart or a coupler drawbar being pulled out completely. This often happened when a train was on a steep grade or when the continuity of radio transmission between master and remote locomotives had been broken while the train was in a tunnel, particularly in the five-mile Connaught Tunnel. These break-in-twos usually occurred behind the remote units.

CP's mechanical officers theorized that as the head-end power encountered a slight easement in the ascending grade there would be an accompanying increase in speed, albeit very slight, in the head-end portion of the train. This would result in a car-by-car stretching of any slack that existed between the master and the remotes.

Meanwhile, the remotes would still be ascending the 2.2% grade, so their speed was somewhat less than the first portion of the train ahead. However, as the speed of the head-end units increased slightly and the slack was progressively stretched, the master's reach would be extended to the relatively significant mass of the remote consist.

Since the remotes couldn't accelerate through the required speed differential before the combined horsepower of the master and the remotes peaked, the resulting coupler force greatly exceeded the strength of the drawbars on the cars. This resulted in a very costly time delay due to the break-in-twos.

If a coupler was pulled while the train was inside the Connaught Tunnel, crew members would have to walk back along the train in the dark to ascertain where the couplers had pulled apart, and often they had to carry a coupler knuckle back to that point. If they were lucky the pulled coupler might just have slipped within its pocket, making it considerably easier to correct. Often, however, the worst was the case and long delays ensued, which in turn held up other traffic on the busy mainline.

As a result of the tests it became quite clear to CP that the remote units would have to be repositioned.
The revised plan called for the remotes to be posi-

tioned at a point in the train where, in a balanced, steady, pulling operation, the "node" or point of zero stress would be located not immediately ahead of the remotes as had previously been the case, but at some point well in front of that. It was reasoned that with the slack bunched behind the "node" and stretched ahead of it, any increase in speed in the head-end portion of the train, due to a reduction in grade or curve resistance, would theoretically result in a gradual stretching of car-after-car between the "node" and the remotes.

This would result in the "node" moving backwards toward the remotes, which in turn would result in a slight lowering of the speed of the head-end units along with a slight increase in the speed of the remotes. This would create a new equilibrium condition within the train itself.

Repeated tests were carried out with trains of 13,200 and 14,200 tons using a 4-4-4 , or 4-5-4, or 4-6-3 allocation of head-end, remote and pusher locomotives. These experiments established that the remote unit set should push 25% of its rated tonnage and pull 75% of its rating. It was also determined that the manually controlled pusher set should push 40% of its rated tonnage and pull 60%, to more effectively control any slack that might be created in the train, and thus reduce the chance of breaking in two.

Since the remotes were radio-controlled, it was necessary to maintain continuity of transmission with the master in order to achieve and maintain maximum operating efficiency.

However, there were situations where continuity was lost due to the trains passing through tunnels more than one mile long, or when the master and remotes were simultaneously passing through two separate tunnels. When this happened, the master and remote transceivers would repeatedly attempt to regain contact.

Failing this, unless "override" control had been established, the remotes would revert to idle after 45 seconds of non-continuity. However, if continuity were quickly restored, the remotes would

CP's first robot car, converted from an express car, is seen at Vancouver's Drake Street yard in July 1968 during testing. (Photo by Grant Ferguson, WCRA Archives)

resume the mode of operation called for by the master.

If continuity was not restored, not only would there be a loss in power, but the brake pipe air pressure would revert to the condition of a conventional train. Normal pipe leakage would then cause sufficient reduction in air pressure to initiate a light brake application, which could possibly lead to a train separation. However, "override" control, either automatic or manual, was a way to delay the remotes from shutting down for approximately 30 minutes of non-continuity. The remotes would then remain operating as they had been when continuity was lost.

During that interval, "master" throttle changes could be made for the leading units, but the remote units would remain unaffected. A train brake application would, however, nullify the override feature, and the remotes would return to idle.

On the Sparwood-Roberts Bank route, the longest tunnel encountered was the Connaught, located between Mile 80.0 and 85.0 on the Mountain Subdivision. It was here that the override control was used on both eastward and westward trains. Trains would enter the tunnel westbound at about 30 mph but would emerge at about 20 mph to prepare for a mandatory stop at Glacier (Mile 85.5) to perform an air brake test, before descending the 2.2% grade to Albert Canyon.

Exiting the tunnel westbound, a careful manipulation of throttle positions on the master and remotes had to be made because of the drastic change in grade from 1% ascending at the west portal to 2.2% descending, just a very short distance beyond that. This made power and braking procedures quite critical. It was soon decided to install radio communication equipment in the tunnel so that there would be no interruption in continuity while trains passed through.

CP conducted numerous tests to establish the various operating procedures that would apply to this new master and remote combination of locomotives in coal trains. At the same time, the railway was also looking at using remote units in trains hauling other bulk commodities, such as grain.

By the spring of 1970, the fleet of coal trains was ready to roll. Initially, this would involve operation of six unit trains of 88 cars, representing a total capacity of six million tons of coal per year.

So it was that on April 28, 1970, the first train started its run all the way from Sparwood to Roberts Bank, arriving on April 30. The target time that had been set for a complete round-trip, involving a distance of some 1,400 miles, was 72 hours. After the first trip, however, it was determined that 82 hours would be a more realistic figure.

Operation in the summer months had to take account of major track maintenance work, so it was decided that running times of 92 hours or even 110 hours would be more practical, and the latter became typical over the years as more trains were added to the route.

In 1971, CP decided to increase the length of coal trains from 88 cars to 104 cars. At one point, it distinguished these with the terms "mini" and "maxi" loads.

However, as equipment and locomotives became more readily available, CP used varying train lengths. Some were 91 cars long while others were either 104 or 108 cars. Eventually this increased to 111 cars and even on some occasions 112 cars.

The longer trains were made up without a robot car in the consist as a result of CP installing the radio equipment in the noses of numerous locomotives used as remote units. This enabled an increase to 112 cars, in the absence of the robot.

By 1985, the number of unit coal trains in the circuit between the mines and the seaport had in-

creased to 20. Some commentators had expected the Tumbler Ridge coal operation in northeastern B.C., which had come into operation in 1983, to have a detrimental effect on the Crowsnest mines served by CP. That was not the case and the two operations increased their production and had no effect on each other. (The two Tumbler Ridge mines were served by BC Rail and CN, with the coal shipped to Asia via Prince Rupert.)

In the original planning stages for the massive coal-hauling operation from southeastern B.C., CP realized that drastic changes would have to be made in the coal cars in order to meet the buyers' huge demands. Anthony Teoli, a senior engineer of car equipment at CP's Montreal headquarters, was given the task of designing the cars, which would be a gondola type.

Mr. Teoli came up with a design that incorporated a brand new concept of construction. The new cars would have several new features, the most unusual being a "dropped belly" which was described as a "downwardly curved parabolic bottom sheet". This portion of the car extended downward between the wheel assemblies and was free of any external and internal reinforcement. The car's sides were secured to this bottom sheet, as were the ends.

This design lowered the centre of gravity substantially, while reducing the car's overall weight, as there was no centre sill. The curved bottom also allowed the coal to be discharged cleanly and quickly at the Roberts Bank terminal.

Owing to their design, CP referred to these cars as "bathtubs".

The weight-to-payload ratio of these steel cars was better than that of any others in North America. The cars weighed 53,000 pounds and could carry a 105-ton payload.

Another feature was a "rotary" coupler. This involved basically a "ball and socket" type of shank, which would allow the car to be rotated on its hori-

Robot car 1001 trails remote locomotives 4501 and 4508 in an eastbound empty coal train at Mile 6.4 of the BC Harbours Board Railway (now the BCR Port Subdivision) on August 22, 1970. (Photo by Dave Wilkie, WCRA Archives)

zontal axis while permitting the couplers to remain upright at all times in their normal alignment. This would facilitate unloading of the cars at Roberts Bank in a rotary dumper, as will be described later.

For the first few years, CP opted to use Alco/Montreal Locomotive Works C-630 or M-630 locomotives on the coal trains. These units had 3,000-hp diesel engines and rode on three-axle trucks. The MLW units had the power for the job and to this day one can remember the "blat, blat, blat " of their exhaust as they started their trains from a signal stop or on leaving Roberts Bank on their run back to Sparwood.

However, after only a few years, CP decided to regionalize its motive power fleet by allocating all Alco/MLW locomotives to eastern Canada and assigning General Motors power to the western provinces. Accordingly, the General Motors SD40 and SD40-2 units came west. Like the Alco/MLW locomotives, they were also rated at 3,000-hp each, but some had to be fitted with the "robotic" controls in their short hoods to operate in master/remote mode before they could be used in coal service. This equipment was transferred from the departed Alco/MLW fleet.

With the continuing growth of the unit trains, there was a corresponding change in the configuration of motive power within the trains.
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The initial configuration of the 88-car coal trains was as follows.

Sparwood to Golden (223.7 miles): two 3,000-hp units on the head-end and two 3,000-hp units behind the 36th car.

Golden to Beavermouth (28.0 miles): four 3,000-hp units on the head-end and two 3,000-hp units behind the 36th car. (This involved adding two more units behind the first two leading units at Golden).

Beavermouth to Stoney Creek (14.1 miles): four 3,000-hp units on the head-end and two 3,000-hp units behind the 36th car, plus four 3,000-hp manually-operated "pusher" units behind the 52nd car.

Stoney Creek to Chase (141.5 miles): four 3,000-hp units on the head-end and two 3,000-hp units behind the 36th car (the same units as from Golden to Beavermouth).

From Chase to Roberts Bank (289.5 miles): two 3,000-hp units on the head-end and two 3,000-hp units behind the 36th car. (The two head-end trailers added at Golden were cut off at Chase.)

For 91-car trains, the power was marshalled as follows.

Fording mine (33.8 miles east of Sparwood) to Golden: two 3,000-hp units on the head-end and three 3,000-hp units behind the 39th car.

Golden to Beavermouth: four 3,000-hp units on the head-end and three 3,000-hp units behind the 39th car.

Beavermouth to Stoney Creek: four 3,000-hp units on the head-end, three 3,000-hp units behind the 39th car, and five 3,000-hp manually operated pusher units behind the 63rd car.

Stoney Creek to Chase: four 3,000-hp units on the head-end and three 3,000-hp units behind the 39th car (same units as from Golden to Beavermouth).

Chase to Roberts Bank: two 3,000-hp units on the head-end and three 3,000-hp units behind the 39th car (same units as Fording to Golden).

Finally, we come to the longer trains, which over the years came to be a normal consist of 111 or 112 cars. These were also to see the maximum power assignment on the section from Rogers (after the pusher base was moved from Beavermouth) up the steady rise of 2% to Stoney Creek, some 36,000 horsepower, the most deployed anywhere on the CP system at that time.

These trains were arranged as follows:

Fording to Golden: three 3,000-hp units on the head-end and two 3,000-hp units behind the 46th car.

Golden to Rogers: four 3,000-hp units on the head-end and two 3,000-hp units behind the 46th car.

Rogers to Stoney Creek: four 3,000-hp units on the head-end, two 3,000-hp units behind the 46th car, and six 3,000-hp units behind the 81st car.

Stoney Creek to Revelstoke: four 3,000-hp units on the head-end and two 3,000-hp units behind the 46th car (same units as Golden to Rogers).

Revelstoke to Roberts Bank: three 3,000-hp units on the head-end and two 3,000-hp units behind the 46th car (same units as Fording to Golden).

In September 1974, CP began operations over a grade revision that resulted from the deliberate flooding of the Beavermouth area by the rising waters of the Columbia River, which were now behind BC Hydro's new Mica Dam. The revision was between Redgrave at Mile 56.9 and Rogers at Mile 67.8 of the Mountain Subdivision.

With this change, the pusher terminal at Beavermouth was moved some five miles west to Rogers, where a new portable bunkhouse was built to house the pusher crews when they were not working. Crews worked so many days on and so many days off. Ernie Ottewell, probably one of the best known engineers to work on the pushers, told me that although it was a boring job at times, the meals were excellent, as was the company of the other engineers who were based there.

Without exception, a pusher set was manned by two engineers, both with many years of service. Ernie told me that the job was sought after by quite a few engineers owing to its short runs and high pay. But in winter, with 6 ft. of snow on the ground, it was not the best job on the railway, and the local grizzly bear population was another factor. At times the bears had to be scared off by the crews whistling furiously or revving up the engines. Ernie said that crews would sometimes have to scramble up on to the engine as fast as they could, especially if a bear with cubs was close by, and often the bears did not scare off too easily.

Another challenge when there was lots of snow on the ground was the difficulty in opening the switches to move the pushers into and out of the spur beside the mainline.

The procedure for cutting in the pusher set was as follows. As a westbound train arrived on the mainline, the head-end locomotives and the remotes would pull past the switch into the spur where the pusher set was waiting. The train would be stopped and then split at the point where the pushers would be marshalled, and the pusher set would emerge from the spur and tie on.

The pusher crew would know the length of the coal train ahead of its arrival, so that the pushers could be spotted in the right position. Of course, with radio communication, the head-end and pusher crews would know each other's position at all times. This was far easier than in steam days, when the brakeman would be on the ground and using hand signals to enable the engine crew and the caboose crew know what was happening.

After making the climb to Stoney Creek, the pusher set would be cut out and enter the siding, then wait while the train was re-connected. Once the train had cleared the siding switch, the pushers would set out eastward, dropping down the grade to their base. They often had to be quick about it, to clear the mainline for other trains in either direction.

CP made more grade revisions in 1979 on the Shuswap Subdivision from Mile 2.0 to Mile 6.1 outside Revelstoke and from Mile 69.0 at Tappen to Mile 80.2 at Notch Hill. The latter involved a new grade for westbound trains that joined the original grade at the top of the hill, with the old grade

retained for eastbound movements. Both the old and new grades are signalled for both directions, so that either can be used as required. For example, if trackwork is taking place on either the new or old grade, the other can be used for trains in both directions.

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One of the benefits of the new grade at Notch Hill was that it enabled CP to remove two of the trailing units on the head-end at Revelstoke, instead of at Chase, nearly 15 miles west of Notch Hill and some 95 miles west of Revelstoke. This increased the availability of motive power for unit train use, without needing to expand the locomotive fleet.

These grades were reduced to enable westbound trains to make a more gradual ascent. After the revision between Mile 2.0 to 6.1, that section was changed to left-hand running, while the Notch Hill revision uses conventional right-hand operation. Interestingly, at both these locations, the tracks are not parallel but are widely separated from the older grades used for eastbound trains.

With the advent of the computer age, the dispatcher (or rail traffic controller as they are known today) could see at a glance where all coal trains were located on the system by means of a computerized print-out. For example, the dispatcher could see that one train was just leaving Sparwood westbound, a second train was westbound between Golden and Beavermouth, a third train was westbound at Kamloops, while a fourth train was leaving Roberts Bank eastbound, a fifth train was eastbound at Spences Bridge, and a sixth train was eastbound between Golden and Sparwood.

With the launch of the new coal service, the loading and unloading of coal trains took on a whole new dimension.

At the mines, the empty train is placed so that the leading car is directly positioned under the loading spout of the silo, with the engineer on duty in the cab of the leading unit. He merely initiates the forward movement of the train when all is in readiness for loading.

At this point an electronic device known as a "pacesetter" takes over. This device is located in the lead (master) unit of the consist and is programmed to maintain a constant train speed of between 0.50 and 0.75 mph throughout the entire loading procedure, by automatically increasing engine revolutions per minute as the train's weight progressively increases.

While this procedure is taking place, the discharge from the silo is automatically suspended for a short interval between the completion of the load in one car until the next car is in place. This suspension of discharge also takes place as the remote units pass through the silo.

In the 1970s, CP stated that it took 2-1/2 to 3 hours to load a 111- or 112-car train. When loading is complete, a mandatory air test is made and inspection is carried out throughout the entire train. The train is then ready to begin its 700-mile journey to Roberts Bank. In the 1970s, the crew changeover points for the coal trains were at Fort Steele, Golden, Revelstoke, Kamloops, and North Bend.

In later years, with heavier power available, consideration was given to changing over at Revelstoke and Kamloops only, but for that to happen crews would be on duty far in excess of the allowed time, so even today CP still uses the same crew changeover points as before (although with directional running, the former change at North Bend on westbound trains now takes place across the Fraser River at Boston Bar on CN's mainline).

At Roberts Bank, the process of unloading takes place. However, unlike the loading process at the mines, the engineer would leave his train upon arrival in the vicinity of the mechanical dumper. The train would then be moved through the unloading process automatically, using a unit called a "mule". This mule would move the entire train around a loop of track and in the process pass through the discharge hopper.

Now we come to the reason why CP introduced

the rotary coupler when the cars were built. When the mule spots each car at the discharge hopper, the car is rotated nearly 180 degrees around its horizontal axis, thus permitting the load to drop into the hopper. After dumping, the car is returned to its upright position and the mule then advances the next car to repeat the process, which continues until the whole train is unloaded. With the trains of the 1970s, this took about two hours.

In the process of unloading, the mule can detect where the remote units are located so that the train will be pulled ahead the length of the two or three units, rather than rotating them.

Since the head-end and remote locomotives (and formerly the robot car) did not have rotary couplers, it became necessary to place a "double rotary" car with a rotary coupler at each end immediately behind the head-end units and immediately in front of and behind the remote units. When in use, the robot cars also were so equipped, as were cabooses. This precaution was taken to avoid the possibility of what is called "harmonic" vibration which can occur during regular train movements and can cause derailments.

As noted before, the most challenging section of the coal train route in terms of power requirements is the approximately nine miles between Rogers (and previously Beavermouth) and Stoney Creek.

Let's look at the make-up of a coal train of the late 1970s working in that section:

Number of cars: 112
Number of 3,000-hp diesel locomotives: 12.
Gross tonnage of train: 14,672 tons.
Tonnage handled per unit: 1,222.6 tons
Length of train: 7,026 ft.
Track grade: a steady 2% uncompensated.
Average train speed: 10 to 12 mph
Average elapsed time on grade: 45 to 50 minutes.

Operating as mid-train remote slaves, MLW M-630 units CP 4516 and 4509 are positioned ahead of the robot car in this westbound CP coal train on the CN Rawlison Subdivision in Langley, B.C., on August 22, 1970. (Photo by Dave Wilkie, WCRA Archives)

Although the above is impressive by any standards, let's assume that CP was still using steam locomotives instead of diesel units. Now let's suppose that the same tonnage noted above was hauled by steam locomotives instead.

Three classes of steam locomotive might have been used.

First, the Light P1, a hugely popular 2-8-2 Mikado type of the 5100 and 5200 series, all with 63-in. driving wheels. The 5100s came in two subclasses -- P1d and P1e -- and the 5200s were designated as P1n.

The second class was the 5300 series, designated as P2a, b, c, d, e or f, also of the Mikado wheel arrangement, but heavier than the P1 class.

The third class was the largest and heaviest steam locomotive type that CP owned -- the 5900 series Selkirk type with a 2-10-4 wheel arrangement, designated as T1a, b or c.

Now let's suppose that this steam-powered coal train originated from the same location and ran to the same terminal at Roberts Bank. Here's what CP would have needed:

Fort Steele to Golden: five P1 5100 or 5200 locomotives and four P2 5300 locomotives.

Golden to Rogers: four 5900 T1 locomotives.

Rogers to Stoney Creek: 15 T1 locomotives, for just nine miles of steady 2% grade.

Stoney Creek to Glacier: seven T1 locomotives.

Glacier to Revelstoke: one Tl locomotive.

The above is more complicated than it might appear.

First, there would be the positioning of locomotives so that each engine or group of two coupled would theoretically be pulling a rated tonnage. The four or five locomotives departing from Fort Steele would be removed at Golden and replaced with four Tl 5900s. At Rogers another 11 Tl locos would be inserted at appropriate intervals, just for the nine-mile climb. At Stoney Creek eight would be removed, leaving seven to haul the train another 8.2 miles to the summit at Glacier, where six engines would be removed, leaving only one to handle the train to Revelstoke. There, four P1 5100 or 5200 engines would take over the train, as the heavy Tl class was not allowed past Revelstoke. At Kamloops, one P1 would be removed, leaving three to take the train forward to North Bend, where another P1 would come off, leaving two to take the train on to Roberts Bank.
The whole notion of steam power on the coal trains is mind-boggling, to say the least.

For starters, each steam locomotive would have a two-man crew. Each engine would require water and one can imagine taking water on even two engines alone, where each would have to move ahead to allow the second engine be spotted under the spout. But with 11 engines one after another requiring water, an incredible amount of time would have been required, not only at each divisional point but at stations along the way. Indeed, the whole exercise would be so time-consuming that instead of 100 or so hours, one would be looking at four or five days to make the trip.

The diesel has certainly revolutionized railways in Canada, so much so that today we take for granted the comings and goings of coal, wheat, containers, oil, toxic chemicals and many other commodities that are hauled by rail.

But let's not forget the era when the use of radio-controlled unit trains with remote locomotives was pioneered. At the time we marvelled at the sheer magnitude of such a project. Yet from those humble beginnings, we have come to today's railways with much more powerful locomotives, as CP's large fleet of 3,000-hp units has given way to an equally large roster of 4,400-hp locomotives, with alternating-current traction motors to boot.

Indeed, CP has more than 700 of these monsters, all of them equipped with Locotrol.

In this article, I have described motive power requirements as they were in the 1960s and '70s. Today's mainline fleet is far more powerful, and the power assignments for each subdivision have changed accordingly. On the final leg of the journey to the coast for today's coal trains, CP typically uses two AC units at the head-end, one mid-train and another at the rear, and the trains exceed 150 cars.
This is made possible by the latest stage of remote-control operation, which enables the remote units to be positioned at multiple points throughout the train, in a concept called "distributed power".

CP long ago extended remote operation to its other types of bulk commodity trains, such as grain, potash and sulphur, and in the distributed power era even intermodal trains are handled in this way, enabling them to be more than two miles long.

Gone by the wayside since CP introduced remote operation are four-man crews, with an engineer and brakeman at the head-end and a conductor and brakeman in the caboose. Now just two men at a time handle mainline trains of all descriptions.

Another change along the coal route is the nine-mile Mount MacDonald Tunnel, which opened in 1988, effectively eliminating the pusher grade from Rogers to Stoney Creek. However, the old grade between those points is still very much in use, but mainly for eastbound trains, with some lighter westbounds taking that route providing they have enough power to do so. Indeed, CP will use the old Rogers line as a passing track to enable a westbound to overtake other westbound traffic as required. In fact, one could say that both grades are used to advantage.

So today's CPR is a far different railway than it was in the 1960s, and even more so than in the days of steam operation. Yet in spite of a great deal

A CP unit coal train passes through the single-car, open-air rotary dumper at Roberts Bank on May 2, 1970, just days after operations began there. The two dumpers in use today are both enclosed within structures. (Photo by Dave Wilkie, WCRA Archives)

of grade revision in recent decades, its western transcontinental mainline through B.C. is still one of the most difficult railways to operate, owing to the challenging terrain. Nonetheless, Canadian Pacific is a railway that knows how to get the job done, as I hope this article has illustrated.

Author's note: I have compiled notes on the foregoing subject through the years, which have aided in writing this article. I must mention one person in particular who inspired me to gather these notes and put them into print. That is the late Walter Paffard, Jr., who gave me many of his own notes on the early days of robot-controlled trains and who was very instrumental in the testing and early operation of CP's unit coal trains.

Walter was CP's former Assistant Superintendent at Revelstoke and later held the same position on the Esquimalt and Nanaimo Railway, until his retirement. Walter, you gave me the tools -- I just hope 1 have used them as you intended me to.

FURTHER READING

"Roberts Bank coal terminal marks 40th anniversary", The Sandhouse, Spring 2010, pp. 22-23.

Sanford, Barrie. "Building CP Rail's Fording River railway", The Sandhouse, Summer 2010, pp. 6-21.

Thanks to Bob Hunter of the West Coast Railway Association Archives for providing a selection of photographs for this article.

MLW M-630 units CP 4580 and 4577 have their 88-car train stretched around the balloon track at Roberts Bank, with caboose CP 439857 bringing up the rear in the foreground, on May 2, 1970, in the first week of operation. (Photo by Dave Wilkie, WCRA Archives)

Following Up:

Readers provide additions, corrections and clarifications to earlier stories in The Sandhouse

CPR's Vancouver Tunnel

PCD member and retired CP manager Don Heron of Calgary has forwarded an interesting article from the June 1947 edition of the Canadian Pacific Staff Bulletin, focusing on what is popularly known as the Dunsmuir Tunnel.

It confirms that regular railway practice applied in the geographical designation of the tunnel's portals. Thus the portal on Burrard Inlet at Mile 129.4 of the Cascade Subdivision was indeed the east portal, even though it lay to the west – by the compass – of the False Creek tunnel at Mile 130.2. This was the subject of discussion in the article "A Tale of Two Portals" in the Winter 2012/13 issue of The Sandhouse (see particularly pp. 12-13).

The 1947 article also reveals that plans were made during the Second World War to use the tunnel as an air-raid shelter should Vancouver come under aerial bombardment. It was estimated that 10,000 persons could have been sheltered.

It also gives the wind speed created by the automated fan system at the east portal – 10 mph.

Cowichan logging railways

Reader Wayne Nolan of Crofton, B.C., sent these comments in response to the article "B.C. logging line set the scene for unique fan-trips" in the Spring 2013 issue.

While Hillcrest Lumber Co. (HLCo) did construct logging spurs, the mainline of its logging railway was laid nearly 20 years previous, by Victoria Lumber & Manufacturing Co (VL&M). As it followed the Robertson River, it was known as the Robertson River Railway. A later branch was constructed to Honeymoon Bay, for the company's Camp 8 operations in the Sutton Creek area. Before leaving for Copper Canyon in 1941, VL&M Camp 10 had operated from three sites along the railway. In 1941, HLCo moved its logging operation from Wheatly (Sahtlam District) to the Robertson River drainage. This logging financed the company until the sawmill entered production in August, 1943.

To exercise control of the railway, which for the most part ran through E&N Land Grant Blocks, following the exit of VL&M, the CPR formed Pacific Logging Co. in 1941. This holding company did no logging and had no railway operations. The line would more correctly be identified as the Pacific Logging Co. railway. At that time, both Lake Logging Co. and HLCo ran trains over it. Being the newcomer, HLCo changed its locomotive road numbers in order to avoid confusion with those of LLCo.

HLCo No. 2/9 was a 50-ton locomotive, not 45. While its light weight was 44 tons, all geared locomotives (except for Willamettes) were classified by their weight in working order.

The Shay referred to as WFI No. 5 was the former Mayo Lumber Co. No. 4 -- a Pacific Coast model. Classed as a 3-PC-13 (3-truck, Pacific Coast type, 13-inch cylinder diameter), this locomotive weighed 93 tons in working order.
HLCo had "run out of timber" because it was the victim of collateral damage in a 1962 dispute between CPR and the other major operators in the region -- British Columbia Forest Poducts, Crown Zellerbach, MacMillan Bloedel & Powell River, and Rayonier. CPR still had considera-

ble "vacant lands" in the area, and wanted shares in those companies in lieu of cash payment for land sales. When the logging companies declined, CPR brought in T.W. McKenzie Logging Co. to log its remaining lands, most of which were in the Robertson River area, and would have otherwise been available for purchase by HLCo.

HLCo Shay No. 1 was classified by Lima as a 24-ton Shay (not 28 tons). This is very confusing, because, at 59,700 pounds (in working order), it weighed more than a 28-ton model. It likely was so classified because it was fitted with 8x8 cylinders, whereas the 28-ton model had 8x10 cylinders, and accordingly had a much higher rated tractive effort. At the time of ordering, HLCo wanted delivery as soon as possible, and Lima's Shay order book was full, causing the only available Shay to be re-gauged from narrow to standard. This locomotive has been out of service at the BC Forest Discovery Centre since the late 1980s, awaiting boiler repairs.

Wayne also notes that the official names of the Mount Rainer Scenic and Cass Scenic lines, the current homes of HLCo. Climax No.10 and WFI Shay No. 5, respectively, use the word "Railroad", rather than "Railway" as incorrectly stated in the article.

Former Hillcrest Lumber Shay No. 1 was still in working condition when photographed at the B.C. Forest Museum near Duncan, B.C., on July 4, 1982. (Photo by Ian Smith)

View from the top

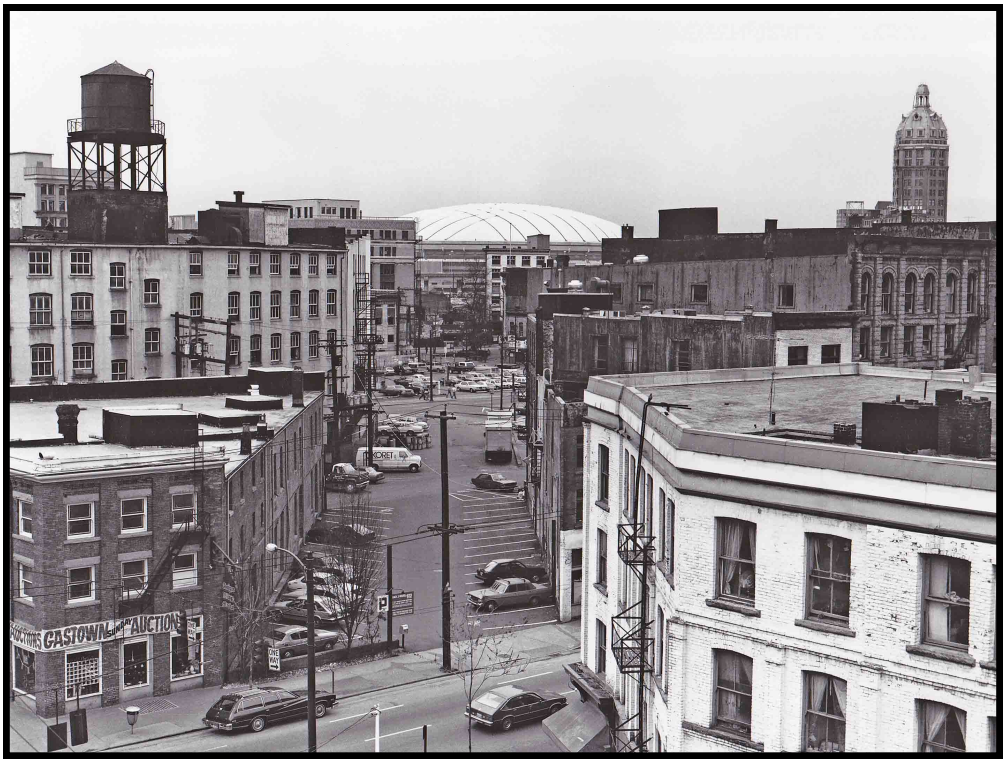
Photos by David J. Meridew

PCD member David Meridew recorded some unique views 30 years ago when he was granted permission to take photographs on two occasions from the rooftop of the four-storey Fleck Bros. building, situated on Alexander Street at the southeast corner of Columbia Street.

From this location in the heart of the Granville townsite from which early Vancouver grew, David recorded the scenes here, looking in three directions, with significant items of railway interest in each one.

Below: Looking southwest on March 21, 1983, David's shot with Powell Street in the foreground shows the right-of-way of CP's English Bay Branch, which the railway used to access its False Creek shops and yards from 1887 to 1932, until the route was supplanted by the tunnel under Dunsmuir Street.

Blocking the right-of-way in the distance is BC Place Stadium, set to open in just three months. At right is a much older Vancouver landmark, the Sun Tower.



David's first visit to the roof of Fleck Bros. came on August 20, 1982, when he shot this scene looking northwest across the last mile of CP's transcontinental mainline. But Canada's other major railway is represented, too, by the elaborate former Canadian National Railways' pier at the foot of Main Street.

The junction of the English Bay Branch and the mainline was just to the right of the signal tower. Passing by is SW1200RSu switcher CP 1207, working the waterfront yard.

This view looking west from the roof of the Fleck Bros. building on August 20, 1982, shows a scene that has changed noticeably in the 31 years since. Numerous tall office blocks now fill the space between the Granville Square building at top centre and the Harbour Centre, with its circular revolving observation deck and restaurant, at left. At right centre, today's scene would be dominated by the Canada Place building with its unique canvas roof suggesting five sails of a ship, which opened in 1986.

CP's waterfront railway yard is still there, although reconfigured to accommodate the fleet of West Coast Express commuter trains that layover during weekdays, and today it often holds strings of "double-stacked" container cars, a development that came after 1982. On this day, the yard is relatively empty, with SW1200RSu switcher CP 1207 working alone, at lower right.

Evergreen Line work marches ahead

With Evergreen Line work advancing, it's time to take a quick tour of the route to see what's been accomplished thus far.

Work has just started on the eastern terminus, Lafarge Lake-Douglas Station, at the northeast corner of Pinetree Way and Guildford Way. Machinery is in place for excavation, ground preparation and foundation work.

Continuing south on Pinetree, the site for Lincoln Station on the west side of the street has been cleared and from there to the Barnet Highway, trees have been removed along the east side of the Coquitlam Centre parking lot, which forms the alignment of the elevated guideway.

In the southwest corner of the West Coast Express parking lot for Coquitlam Central Station, excavation is in progress for the SkyTrain station of the same name. The parking spaces eliminated by this work have been replaced at the northwest corner of the lot, in an area surrounding the Evergreen Line project office.

For about two-thirds of a mile west of here, no visible work is underway. But starting at Mile

Assembly of the launching girder was well advanced in this scene on November 28 at the northwest corner of Como Lake Avenue and Clarke Road. From here it will work south on Clarke and North Road. *(All photos by Ian Smith)*

114 of the CP Cascade Subdivision, the land immediately north of the tracks has been cleared and pre-loaded in preparation for the Evergreen Line's at-grade guideway, which will run on a shelf above the height of the railway mainline.

This stretch runs for about three-quarters of a mile, where it comes to the site of the Evergreen Line's most disruptive work yet. This took the form of building a 4,000-tonne rectangular concrete box to enclose the guideway and platforms for Inlet Centre station, which will sit under the Barnet Highway overpass, with entrance buildings on either side of the bridge.
The box, some 50 metres long, was built on the east side of the bridge. Then, over the long weekend of November 9-11, the box was shoved almost entirely under the bridge, whose roadway had been excavated at the east end, making it impassable to traffic. Thirty hydraulic jacks were used for this job, which was accomplished in a single long weekend, enabling project officials to cancel a second road closure that had been planned for the following weekend as a contingency measure.

Moving west from the overpass, land clearance has continued on the north side of the CP line as far as the west leg of the Ioco Spur wye, where the Evergreen Line will cross over the railway on an elevated structure (see photo, page 25, previous issue).

From there, the line will return to grade on the

Before: *This rectangular concrete box to house the platforms and running lines at Inlet Centre Station was cast in place on the east side of the Barnet Highway overpass in Port Moody, as seen on November 8. Some 50 metres long, it weighs in at 4,000 tonnes.*

south side of the CP tracks, and grading is in progress along this stretch almost as far as the Port Moody WCE station. Within the station area itself, the line's right-of-way has been graded, taking up much of the WCE parking lot. Three separate smaller lots have been built to compensate for this, and a new entrance to the lots has been created by extending Hugh Street northward.

Continuing west toward Port Moody village on the north side of Clarke Street, several commercial buildings have been demolished and trees have been removed, drawing howls of protest from neighbouring apartment dwellers, who were previously shielded from the sight of the CP mainline by the vegetation.

Nearing the Barnet Highway, several guideway support structures have been cast, and the cast-in-place portal for the 2-km tunnel under Clarke Road hill has been completed immediately below the east side of the highway. The workface where the tunnel boring machine (TBM) will start work is about 100 ft. west of the highway – most of the intervening space is in a cut-and-cover "transition" tunnel under the road, which has been completed.

Components of the TBM are being delivered by road and rail from Ontario, and will be assembled in time for boring to start in February. Assembly of the 85-metre-long TBM will take place within the cut-and-cover tunnel and a short open-air gap between the highway and the work-

After: *In this view four days later, the box has all but disappeared, with only the tip sticking out at left. During the intervening weekend, it had been shoved into place beneath the overpass by hydraulic jacks, sliding on the steel beams still visible here.*

face. The assembled TBM will be 10 metres in diameter, and will bore a single tunnel wide enough for both tracks.

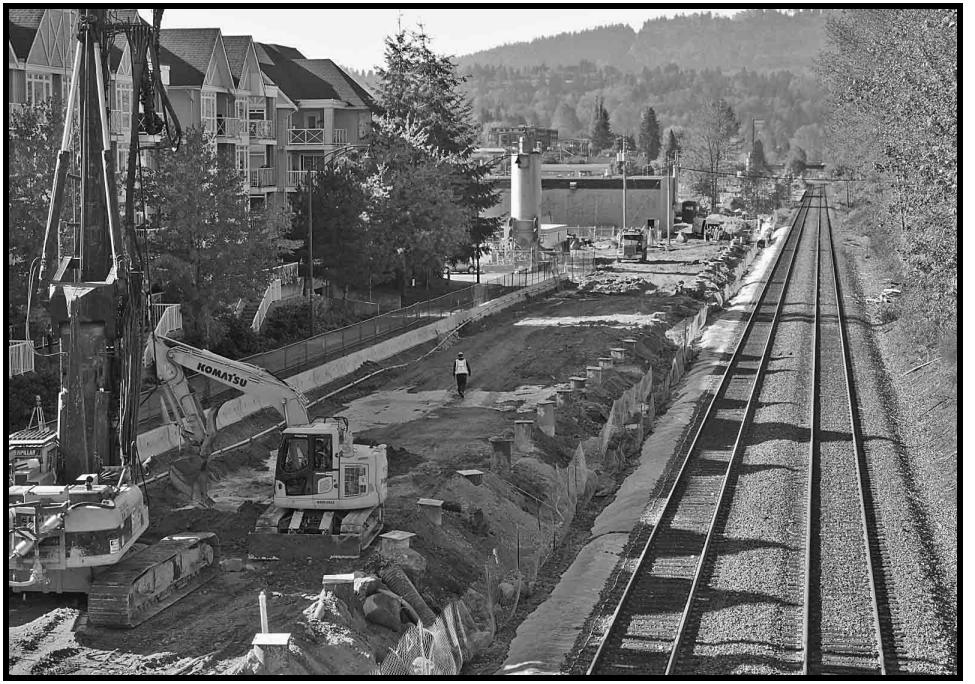
At the tunnel's west portal, at Kemsley Avenue in Coquitlam, on the west side of Clarke Road, a cutting has been excavated to accommodate a cast-in-place transition tunnel for the tracks as they rise from the bore.

Just beyond here, at the northwest corner of Clarke and Como Lake Avenue, a tangible symbol of the project work is taking shape. The launching girder that will lift precast guideway segments into place between the support columns is in an advanced state of assembly, after two months of work. This behemoth sits atop the first two columns to be completed (see photo, page 27, previous issue), and will soon be ready to march south.

Altogether, eight columns have been completed to reach the site of Burquitlam Station, where five support beams, each supported by two cylindrical columns, have been erected. To the south, another six columns have been completed, reaching the junction with North Road.

Continuing south on North Road, three columns are at various stages of progress, before reaching Foster Avenue, and from there southward, machinery is hard at work preparing the ground for more columns.

Farther south, beyond Lougheed Mall, at the intersection of North Road and Gatineau Place,



The view west from a footbridge in Port Moody on October 22 shows grading work in progress for an at-grade section of guideway, running parallel to the double-track mainline of CP's Cascade Subdivision.

Five support beams for Burquitlam Station stand ready for the launching girder and installation of guideway segments, in this view looking southwest from the parking lot of Burquitlam Plaza on November 28. Below, grading is in progress for the at-grade guideway approaching the future Moody Centre Station, looking east on October 22. To the right is the condensed West Coast Express parking lot; three extra lots have been created to make up for the lost spaces.

rebar cages for two columns are in place, awaiting formwork and pouring of concrete.

This brings us near to the line's junction with the Millennium Line, just to the east of Lougheed Town Centre Station. Here, several support columns are in progress, and three precast concrete spans have been placed atop columns that were built in 2002 in anticipation of this extension (see cover photo, Autumn 2011 issue). These existing columns have been augmented with added castings to suit the design of the new guideway.

The work concludes within the station itself, where a platform for the third track is being created. However, this takes place behind tarpaulins and plywood barriers, concealed from public view.

Considering that major construction only began in February, much has been accomplished in the nine months since then, but much more work awaits, with the line set to open in mid-2016.

At the junction with Millennium Line, three spans have been placed atop columns that were built in 2002 in anticipation of the extension to Port Moody and Coquitlam, as seen on November 28. These spans will support the eastbound line, as Evergreen Line trains will use left-hand running on either side of Lougheed Town Centre station to accommodate the platform layout.

SHORT HAULS

The Events of Today are the History of Tomorrow

BCR still has 20 employees, most of them working on the Port Subdivision operation that includes the yard at Roberts Bank and 22 miles of track eastward to the connection with CP near Cloverdale.

According to information released to the Vancouver Sun, 17 of the 20 work on the Port Sub., and two are executives. Port Sub. workers handle train dispatching and track inspection and maintenance.

The question arose after the NDP opposition in the B.C. legislature demanded to know why BCR still needs 20 employees after its freight operation was sold to CN in 2004.

Besides operating the Port Sub., BCR manages a real estate subsidiary and is the counter-party to CN's lease of the former BC Rail trackage other than the Port Sub.

B.C.'s auditor-general examined BCR's 2012/13 financial statements and found that the Crown corporation made a total of about $18 million, including $7.9 million from the leases of track and other assets and $7.5 million from Port Sub. operations, while incurring expenses of around $15 million, for a profit of $3.3 million. It also made a $2.1 million profit from sales of non-rail property. (*Vancouver Sun*)

Okanagan valley rail service is being revived by CN after the Kelowna Pacific Railway shortline ceased operations on July 5 upon being placed into receivership (see previous issue, pages 41-42). KPR had operated in the region since 2000, mainly on leased CN track.

CN intends to restored service on 97 miles of track from Campbell Creek to Vernon and Lumby, representing about 75% of the track operated by KPR. However, CN will not operate south from Vernon to Kelowna, owing to what it describes as insufficient freight traffic. Operations were expected to begin in December.

One Kelowna shipper, Ashland Chemicals, retained former B.C. attorney-general Barry Penner to seek an injunction against CN's plans to abandon the 31 miles of line between Lumby Junction and Kelowna, but that action was dismissed by the Canadian Transportation Agency in late October.

Restoration of service involved reaching five-year agreements with two units of the Teamsters Canada Rail Conference, representing about 35 employees in the running trades and maintenance of way, and securing a deal with Tolko Industries Ltd., the forest products firm that is the line's major shipper. (CN/TCRC/*Kelowna Capital News*)

CN has cancelled its order for 30 SD70ACe locomotives from Electro-Motive Diesel that were to be numbered 8100-8129.

The order was placed in 2012, along with an order for 35 ES44AC units from GE Transportation. The GE order was completed in March this year, making those the only AC units on the CN roster. (*Branchline*)

Another 35 ES44AC units are being built by GE Transportation, as a result of the order for Electro-Motive Diesel units being cancelled. These will be numbered 2835-2869; initial deliveries began in late October. (*Branchline/Tempo Jr.*)

Tentative collective agreements have been reached by CN and the union representing its 3,000 Canadian conductors, trainpersons, yardpersons and traffic co-ordinators.

If ratified, the three-year deals will succeed the contracts that expired on June 22 this year. (CN)

A fiery derailment at Gainford, Alta., 58 miles west of Edmonton, made headlines after tank cars exploded, resulting in 126 residents of the tiny community being evacuated for four days and sparking fires on both sides of the parallel four-lane Yellowhead Highway.

Thirteen tank cars derailed in Vancouver-bound Train M301 on October 19, including four loaded with crude oil for Chevron that were destined to a trans-load facility in Langley. The crude oil cars were pulled a safe distance away and did not catch fire, but three of the nine cars loaded with propane burned for days.

There were no injuries in the Gainford derailment, but the fires and evacuations prompted renewed concern about the safety of shipping highly flammable products by rail, in the wake of the Lac-Mégantic disaster in July.

The CN Edson Subdivision was blocked for several days, resulting in rerouting of some traffic via CP and causing some VIA trains to be terminated at Edmonton or Jasper (see VIA section). The line re-opened at 18:50 on October 22, some 89 hours after the derailment, which occurred when the 134-car train was entering a siding. (*Globe & Mail*/Tim Stevens/CN)

CANADIAN PACIFIC

The remaining green GP38AC unit, numbered CP 3005, departed Coquitlam in September for overhaul at National Railway Equipment in Silvis, Ill., where it is expected to shed its unique paint scheme.

Sister CP 3004 and 3005 gained their dark green livery when they were selected in 1996 to work on Vancouver Island in CP's short-lived E&N Railfreight internal shortline. That look included a broad yellow band on the midsection of the carbody with the words E&N Railfreight in black, along with the letters E&N against a yellow background on the nose.

While on the Island, one or the other of the pair regularly worked with CP units in the conventional livery, as they were regularly cycled back to Coquitlam for maintenance.

The units returned to the mainland for good when RailAmerica took over Island operations at the start of 1999, but 3004 retained the full E&N look and EN reporting mark until 2005, when it received the current CP livery.
EN 3005, on the other hand, was converted back to a CP identity in 2000, but in mongrel fashion.

It kept its overall dark green, but the yellow band was changed to a moss green. The stacked words "Canadian Pacific" in capitals were applied the bodysides in conventional style, but with the word "Canadian" fitting into the moss green band, thus accentuating the differences of green shade.

In general, this patchwork look did not find favour with railfans, with some calling the locomotive the "vomit bonnet", a play on the Warbonnet name given to Santa Fe diesels in their heyday. (Corwin Doeksen/Earl Roberts/Editor)

Three GP38s have been assigned to Coquitlam from other CP bases.

GP38AC 3013 has been transferred from Moose Jaw after overhaul at National Railway Equipment in Silvis, Ill., in a swap for sister 3007 which went to Moose Jaw after similar work. GP38-2 units 3023 and 3050 have been reassigned from Calgary. (*Branchline*/Earl Roberts)

CP has resurrected four of its SD90-43MAC locomotives, after withdrawing the entire remaining fleet of 58 units and putting them up for sale in the autumn of 2012. To date, none of them has been sold.

Pressed back into service in November were CP 9108, 9134, 9142 and 9157. (Bill Miller)

The Calgary diesel shops will be closed as a result of a Canadian Transport Agency order that CP stop the practice of load testing diesel locomotives between 23:00 and 07:00.

CP says the order, issued on September 13 with immediate effect, fails to recognize its operational requirements. The shops, located within Alyth Yard, date back 60 years and currently have a workforce of 130.

The repair and maintenance work performed at Alyth will be distributed to other shop facilities on the CP network. (CP)

Record earnings for a single quarter were achieved in the third quarter of 2013, as CP earned a net $324 million on revenues of $1.5 billion.

With operating expenses dropping at the same time, the railway saw its operating ratio improve to 65.9%, the best in its history. By comparison, the ratio for the same quarter of 2012 was 74.1%.

CP's share price surged to close at $148.53 on October 23 when the quarterly results were announced, marking the highest closing price since activist investor William Ackman took control of the company in May 2012. The price hit $150.42 during that day's trading session, and has since closed as high as $161.18, on November 27. (CP/*Financial Post*)

The hedge fund firm headed by William Ackman has divested itself of about one-third of its shares in CP, with 5.96 million sold in late October at about $140 a share. That brings its total divestiture to some seven million shares, but Pershing Square Capital Management remains the company's largest single shareholder, with about 17 million shares.

When Pershing Square announced its plans for the sell-off in June, its 24.2 million CP shares represented 26% of its assets, which some financial analysts considered to be too high a concentration in one investment. (*Financial Post*)

CP's Holiday Train will stop in 23 B.C. communities this year from December 10 through 16.

Making its first stop at the Montreal suburb of Beaconsfield on November 26, the train will enter B.C. via the Crowsnest Pass route, stopping as follows: December 10 – Sparwood, Fernie, Jaffray, Cranbrook; December 11 – Creston, Castlegar, Nelson; December 12 – Radium,

Golden; December 13 – Revelstoke, Salmon Arm, Sicamous, Notch Hill; December 14 – Chase, Kamloops, Savona, Ashcroft; December 15 – Lytton, North Bend, Agassiz (18:30), Maple Ridge (21:00, Port Haney WCE station); December 16 – Port Moody (17:45, behind recreation centre on Ioco Spur), Port Coquitlam (19:15, WCE station).

A U.S. Holiday Train will make its first stop in Kahnawake, Que., on November 25, and finish in Weyburn, Sask., on December 19, after stopping in three provinces and eight states.

This will be the 15th year of Holiday Train operation. As before, those coming out to see the train are asked to bring a donation of food or cash for local food banks. (CP)

The Royal Canadian Pacific luxury train will not make any scheduled runs in 2014, but will operate charter services if booked. A notice at the train's website states: "Royal Canadian Pacific is not available for public tours in 2014. Please contact us directly to inquire about private charter." (Corwin Doeksen)

CP's Kootenay Valley Railway internal shortline has ratified a new agreement with its running trades employees, effective June 1 this year through December 31, 2016.

The new deal was made early, only 17 months after the previous agreement took effect, and includes some significant changes. The KVR profit-sharing incentive program has been eliminated, in exchange for wage increases higher than those for CP as a whole.

KVR employees will get general wage hikes of 6% in each of 2013 and 2014, followed by 3% in each of 2015 and 2016. That compares with 3% for each of 2013 and 2014 for CP in general.

The last clause of the agreement states that: "The Company agrees to retention of railway operations on the property governed by this agreement until December 31, 2016."

The KVR was established as an internal shortline in on June 1,1997, covering the territory from Curzon to Nelson, Castlegar, Trail and Warfield. As such, it operates as a semi-autonomous unit with less restrictive work rules and pay structures than those of the parent company. (Corwin Doeksen)

A coal re-spraying facility will be built on the BNSF system about halfway between the Power River coalfield mines in Wyoming and Montana and the coal terminal at Vancouver, from which the product is shipped to Asia.

BNSF made this commitment in a letter to Westshore Terminals, operator of the coal port at Roberts Bank, dated November 7. It said the facility should be operational by mid-2014.

This will enable the coal to be re-sprayed with a dust suppressant, after the initial spray is applied at the mines.

CP has had such a re-spraying facility in place since 2003 at Carlin, near Notch Hill, about

halfway between the Crownsest region and Roberts Bank. At the Carlin facility, the load is each car is re-sprayed twice with a binding polymer foam as the train proceeds westward. (BNSF/Westshore Terminals)

Surrey and White Rock are banging the drum again to have the BNSF mainline along the shoreline of Semiahmoo Bay and Mud Bay relocated inland.

This follows a similar push by Surrey in 2002 that called for the line to run along 180th Street to connect with the BCR Port Subdivision. Concerns cited by the current mayors of the two cities include blocked grade crossings in Crescent Beach and protection of the surrounding wetlands, and they also want to create a public seawall trail along the line.

Ironically, this line was built in 1909 to replace an inland route (see "Building GN's rails across the border," Spring 2003 issue).

A BNSF spokesman said there had not been a significant derailment on the route since the 1940s, and noted that he had not been invited to a public forum scheduled for November 26. (*Vancouver Sun*)

Rail Industry

CP supremo Hunter Harrison has weighed in on the debate surrounding oil shipments by rail, saying another disaster like the Lac-Mégantic tragedy could happen without tougher regulations.

Harrison said in an interview that the push for safer tank cars has long been resisted by the commodity producers and private owners of North America's tank cars, who would bear the costs of renewing their fleets. "The root of all this is the dollar sign," he said. "We can fix all this stuff, it's fixable."

Regulators need to require stronger cars, set tighter safety rules and impose stiffer penalties for companies and employees who knowingly mislabel hazardous goods, Harrison said. He pointed out that under common-carrier rules, railways are obliged to transport cargoes that comply with regulations, making it vital that the regulations themselves are adequate.

Canada's Transportation Safety Board announced on September 6 that the crude oil that exploded in the Lac-Mégantic disaster had been mislabelled by the shipper, which hid the fact that it had a lower flash point than indicated.

Shipments of crude oil under the placard 1267 are denoted with a sub-classification, or packing group, that is numbered 1 to 3, depending on the flashpoint of the product being shipped. The oil that exploded at Lac-Megantic actually had a flash point of 2, but was mislabelled as 3, which indicates a higher flash point.

Harrison called for the single-hulled DOT-111 class tank cars to be replaced by double-hulled cars with front and rear shields, along with better vents for escaping vapours.

His comments were echoed in November by the Association of American Railroads, which called on U.S. regulators to require "all tank cars used to transport flammable liquids to be retrofitted or phased out, and new cars built to more stringent standards." Of the 92,000 tank cars handling such products, the AAR says 78,000 need to be phased out or retrofitted, and another 14,000 newer cars would also need some retrofitting. (*Globe & Mail/Railway Age*).

New regulations for testing oil shipments were introduced by the federal government in mid-October, a month after Hunter Harrison's interview cited above.

The new rules require "any person who imports or transports crude oil to conduct classification tests on crude oil." Tests must be done on products whose cars carry placards numbered 1267 (for crude oil) or 1993 (for flammable liquids).

Left unclear was which party is responsible for the testing – the shipper, carrier or receiver. (*Globe & Mail*)

A grain car shortage is hampering Canadian wheat producers during a record harvest, according to the Western Grain Elevator Association.

With this year's Prairie harvest up 14% to a record 80.8 million tonnes, grain producers and shippers are frustrated that car supply has not kept pace. CN and CP were each providing 5,000 to 5,500 cars per week during October, but the association says twice that amount was needed. (*Financial Post*)

VIA has set a limit on the size of deficit it will incur to reinstate passenger service on Vancouver Island.

In a climate of cost-reduction for federal government operations, VIA says it will not exceed a deficit of $1.4 million to run the service, although it the past its subsidy ranged up to $1.9 million.
VIA also maintains that the $1.8 million deficit proposed by the Island Corridor Foundation, which owns the Island line, does not reflect infrastructure maintenance costs, which VIA pegs at $6 million over five years, or $1.2 million a year. That, says VIA, amounts to a request that the federal government subsidize the service to the tune of $3 million year, well above the $1.4 million that VIA has available.

The ICF proposal would see a Nanaimo-Victoria commuter run in the morning and a return trip in the evening, bracketing the regular Victoria-Courtenay round-trip. (*Nanaimo Daily News,* in *Branchline*)

Two consists of Train No. 1, the westbound Canadian, operated in a merged train from Edmonton to Vancouver on October 25-26, after the fiery derailment of a CN freight train at Gainford, Alta., had prevented the departure of the train scheduled to leave on October 22. Instead, its equipment waited for the next westbound, scheduled for October 25.

The combined train consisted of four locomotives on the head-end and 29 cars. The intact consist of the first train formed the empty front half of the merged train, meaning that its Park observation car was roughly at mid-train. Arrival in Vancouver on October 26 was seven hours late, at 16:40.

Passengers in the first train, which had been annulled at Edmonton on October 22, were bused to Jasper, where they joined the consist of the eastbound Canadian that had been terminated there. That train then returned to Vancouver. (Terry Muirhead)

Two departures per week operation of the Canadian began two weeks earlier this year than in 2012, when the curtailed service was introduced for the off-peak seasons, starting in late October.

This year, the last Sunday departure from Vancouver was on October 6. Thereafter, departures

are on Tuesdays and Fridays only until Sunday, May 4 next year, when three times a week operation resumes.

The early start to curtailed service this year came despite the fact the timetable says the reduced service begins as of November 1. (Terry Muirhead/VIA)

CP will no longer crew WCE trains, after giving notice that it will cancel its contract to do so.

The firm taking over as the provider of engineers and conductors had not been identified as of press-time, nor had the starting date.

It advertised anonymously in The Province newspaper on September 5, as follows: "International Transportation Company is bringing its Global expertise to Vancouver and the Lower Mainland Commuter network. Experienced passenger and commuter Locomotive Engineers and Conductors will be required to staff a regional commuter rail system. Qualified applicants are requested to email resumes for immediate consideration."

CP has provided crews for WCE trains since the inception of service on November 1, 1995. Other bidders for the work at that time were Burlington Northern Railroad and Herzog Transit Services, the latter being the contract operator of Miami's Tri-Rail commuter service.
This contract was separate from the 20-year track access contract between CP and WCE, and was awarded for five years, with all subsequent renewals for a further five years going to CP. The value of the second contract, from 2000 to 2005, was about $1.6 million annually. (*The Province* via Ken Storey/Editor)

Trains W5/E1 now use nine cars, as WCE adjusts consists to meet demand.

The fifth and final train of the morning had operated with eight cars since WCE expanded its fleet by seven cars in mid-2010, with each train gaining one car and two being added to the spare pool (see Autumn 2010 issue, page 19). However, with rising passenger loads, Train W5 had been leaving its final inbound stop of Port Moody with some passengers unable to find a seat, so WCE decided to reduce the consist of Trains W1/E5 by one car, as these have the lightest loads, being the first train of the morning and the last of the evening.

Train W1/E5 has thus reverted to a four-car consist, the same as before the 2010 expansion. Consists of the other trains are: W2/E2 – eight cars; W3/E3 and W4/E4 – 10 cars.

Extension of W5/E1 to nine cars means there is plenty of space on the first homeward run, which departs Waterfront at 15:50, well before the end of the workday for many employees. (Editor)

Compass Cards will have their first regular use on West Coast Express, starting in the late spring of 2014.

Trial use of the stored-value cards took place over three weeks from September 9 to October 1, with 10,000 volunteer testers being able to use them on all modes of TransLink service.

SkyTrain

Refurbished Mark I cars have begun to operate in regular service as of November 20.

Cars 011-012/064-063 were seen forming a four-car train at the east end of the Expo Line in Surrey on November 23. They wear the current TransLink livery of black, blue, grey and yellow.

Work on the 114 original cars, built in 1984-85, includes: upgrading the electrical systems; expanding passenger capacity by removing four seats, thus creating eight standing spaces; renewing doors and interior amenities; and new seat cushions.

The seat reduction was accomplished by replacing double-seats with single seats. The new layout has only two double-seats. Seated capacity is now 32, including the fold-down jump seats used by SkyTrain attendants for manual operation that are available to passengers at other times.

This work will extend each vehicle's lifespan by 15 years to a total of 40-plus years in operation. The refurbishment program will be complete by December 2016.

Cost of the project is $37.9 million, with $28.5 million coming from the federal Gas Tax Fund. (TransLink/Editor/Chris Wasney)

The first refurbished Mark I cars, 011-012/064-063, are seen at Lake City Way Station on the Millennium Line on November 28. (Photo by Ian Smith)

The former Bombardier facility in Burnaby where the original fleet of Mark II cars was assembled is being revived for use in refurbishing the earliest Mark I cars.

Opened in May 2000, the 92,000-sq. ft. plant was purpose-built at a cost of $18.5 million for the assembly of the Mark II cars. The first two of these were built at Bombardier's facility in Kingston, Ont., but the remaining 58 (numbered 203-260) were assembled in Burnaby from parts built elsewhere (all body-shells were made in Kingston).

Bombardier's agreement with the B.C. government required the province to purchase the plant afterward if the firm did not win a five-year contract to maintain the Mark II fleet. TransLink decided to maintain the cars itself, and the province ultimately bought the building, which was subsequently used by the Mac and Jac clothing firm.

During September, concrete ties and rail were installed to re-instate the severed single-track connection with the adjacent yard at SkyTrain's Operations and Maintenance centre, which lies to the north across Southridge Drive.

At press-time, the facility was not yet in production, so the first upgraded units would have been refurbished elsewhere. (Editor/Chris Wasney)

For a look at the prototype that preceded the Mark I cars, see the Parting Shot on page 50.

Port News

Fraser Surrey Docks has proposed various changes to its plan to ship U.S. thermal coal by barge to Texada Island for ocean-shipping to Asia, after delivery by BNSF trains from the Powder River Basin of Wyoming and Montana.

The measures include not stockpiling coal at its Surrey facility and having the coal delivered in bottom-discharge hopper cars that would release their loads into enclosed, shallow receiving pits equipped with water-misting systems. Also, the barges would not operate in winds exceeding 25 mph and the loads in trains would be sprayed with dust-suppressants at two points in the trip.

The changes were announced after completion of an environmental study for FSD by SNC-Lavalin, which gave the project a green light, providing measures such as those above are adopted.

The study was quickly denounced by the chief medical health officers for the Vancouver Coastal Health and Fraser Health authorities as incomplete and narrow in scope.

Five municipalities, including Surrey, oppose the proposal.

The plan calls for initial shipments of four million tonnes per year, representing one 12,500-tonne train daily, but envisions that doubling in time. By comparison, shipments through Westshore Terminals at Roberts bank and Neptune Bulk Terminals in North Vancouver amounted to 32.7 million tonnes in 2012. (*Vancouver Sun*)

The Low Level Road replacement project along the North Vancouver waterfront is about one-quarter complete, with a new elevated road taking shape behind a high retaining wall.

The project will see the current three tracks beside two major grain elevators augmented with two more tracks. The running line which continues on to the former BC Rail yard will be shifted north on to the right-of way of the current road and a new storage track built beside it, also on the road alignment. The existing running track will be converted to a storage track, making for four storage tracks altogether.

Port Metro Vancouver says this will enable long unit trains of grain to be split with fewer switching moves, thereby reducing noise for nearby residents. (Port Metro Vancouver)

Preservation

Ex-BCER interurban car 1220 has a new home at No. 1 Road and Moncton Street in the Steveston district of Richmond.

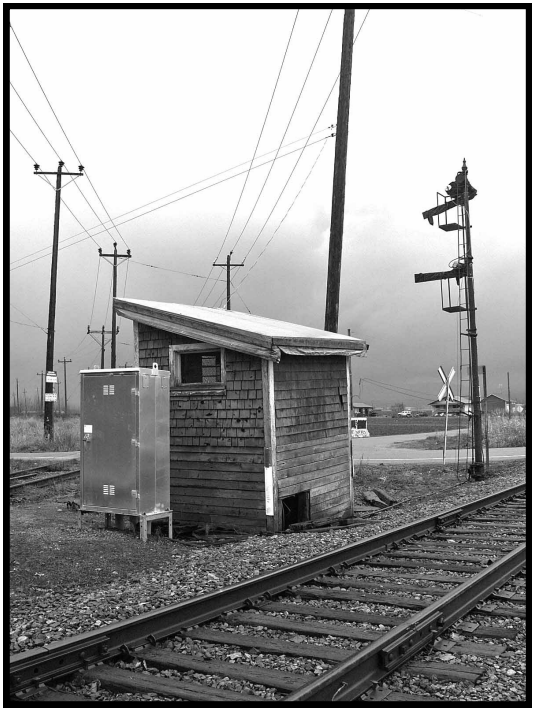
The new building was opened to the public on May 13.

After many years in the custody of the Steveston Interurban Restoration Society, car 1220 officially became city property after the municipality settled a dispute over ownership with the society in 2006, paying the society $400,000 for the restoration work it had done. The city has placed the car under the wing of the Richmond Museum. (*Branchline*)

The Clayburn interlocking cabin was removed during the summer for donation to the

The replacement for Low Level Road is seen taking shape above the existing road, in this view looking west on September 14, from the entrance to Neptune Bulk Terminals. Two additional CN tracks will be built on the road's alignment. (Photo by Ian Smith)

Fraser Valley Heritage Railway Society. The iconic relic of the B.C. Electric Railway's inter-urban era once controlled the semaphore signals protecting the diamond crossing of the Southern Railway of B.C's Fraser Valley Subdivsion and Canadian Pacific Railway's Mission Subdivi-sion.



Clayburn then and now. The deteriorating interlocking cabin was decommissioned but intact in the above view on December 7, 2012, its functions assumed by a soul-less metal cabi-net, which now stands solo, as seen at left on October 29 this year, following the cabin's removal. The photo above shows decomis-sioned CP semaphores at right. (Photos by Ian Smith)

Books

PCD member Robert Turner has completed the second volume of his work on the Es-quimalt & Nanaimo Railway, co-authored with the late Donald MacLachlan. Covering the die-sel era from 1949 to the present, the 324-page volume is replete with colour and black-and-white photos, detailed drawings, and an extensive bibliography. Published by Sono Nis Press, the book is excellent value at $49.95 (hardcover) or $39.95 (softcover).

THE SANDHOUSE

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Kelly's Kaboose, 634 Victoria St., Kamloops (250) 377-8510

All contributions are gratefully received, but are subject to editing. Please send all news items, photos and articles to the Editor, care of the Division address (see page 2).

Ian Smith — Editor

Parting Shot

Innovia ART 100 car 2135 is seen in the warehouse of the Canada Science & Technology Museum, Ottawa, in 2012. It was one of two cars, numbered BC-1 and BC-2, used for the SkyTrain demonstration service in Vancouver in 1983. (Photo by Paul Bown)

Canadian Railroad Historical Association, Pacific Coast Division

P.O. Box 1006, Station A Vancouver, B.C. V6C 2P1

WE INVITE YOU TO JOIN US

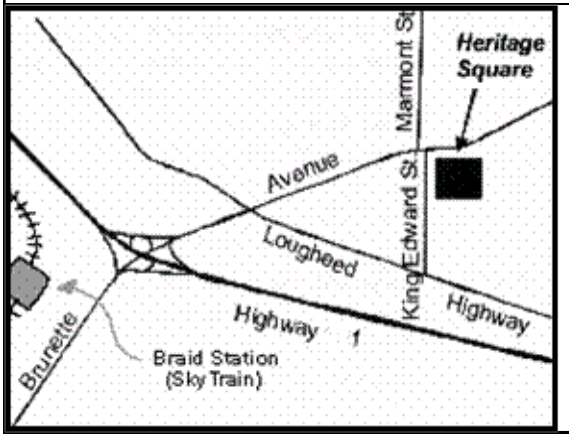
Get together with fellow railway enthusiasts and take part in the varied activities of the CRHA's Pacific Coast Division.

We meet nine times a year on the 3rd Thursday of the month (see below)

- Meetings feature slide shows, video programs, talks by railway officials and writers on railway subjects, and the opportunity to socialize with other railway enthusiasts.
- We publish **THE SANDHOUSE**, a quarterly journal on B.C. railway matters. Membership dues include a subscription.
- We operate a museum in the preserved Fraser Mills CPR station at Heritage Square, Coquitlam
- We're restoring a CP Rail caboose at Heritage Square.

We hope you'll join us. Please send your address details (name, full address, phone number, e-mail), together with your payment, to our postal address or bring it to one of our regular meetings.

Annual dues are: $30 for Canadian residents; $35 U.S. for U.S. residents and $40 Overseas



Pacific Coast Division's regular meetings are held on the third Thursday of each month (except July, August and December) at

Heritage Square, Place Des Arts
1120 Brunette Avenue
Coquitlam, B.C.

Informal socializing starts at 7:15 p.m.
Presentations begin at 7:30 p.m.

Top of the line