OPERATION ON THE YULAN VALLEY RAILROAD TIMETABLE & REPUBLIC STEEL SCHEDULE

By Bruce Temperley

Over the last fourteen or more years, Neville and I have been operating the layout with a variety of operating methods from waybills to random generated switch lists. With each subsequent change in layout, which happens quite regularly, we have had to make corresponding changes or even adopt an entirely different scheduling system. The latest layout rebuild featuring a Blast Furnace, steel processing and steel manufacturing has proved to be no exception.

The adjacent diagram is drawn from a planning perspective to show connectivity between the three main yards and principle activities.

Waterside is the gateway to all Republic Steel operations.

B.O.F. includes receipt of process scrap from Valley Forge.

Acid Plant is an independent industry with direct rail connection through the Blast Furnace complex onwards to Valley Forge.

Industries at Valley Forge;
- Scrap Metal for B.O.F.
- Pipe & Forge Plant
- Slag Reclamation Plant

Storage Area is a secondary marshalling yard to hold Ore and Coke Trains between cycles and to avoid handling.

There is a regular passenger service operated from Valley Forge, stopping at Bay Ridge, then hypothetically through to the mainline

Mainline Interchange: off layout car storage.
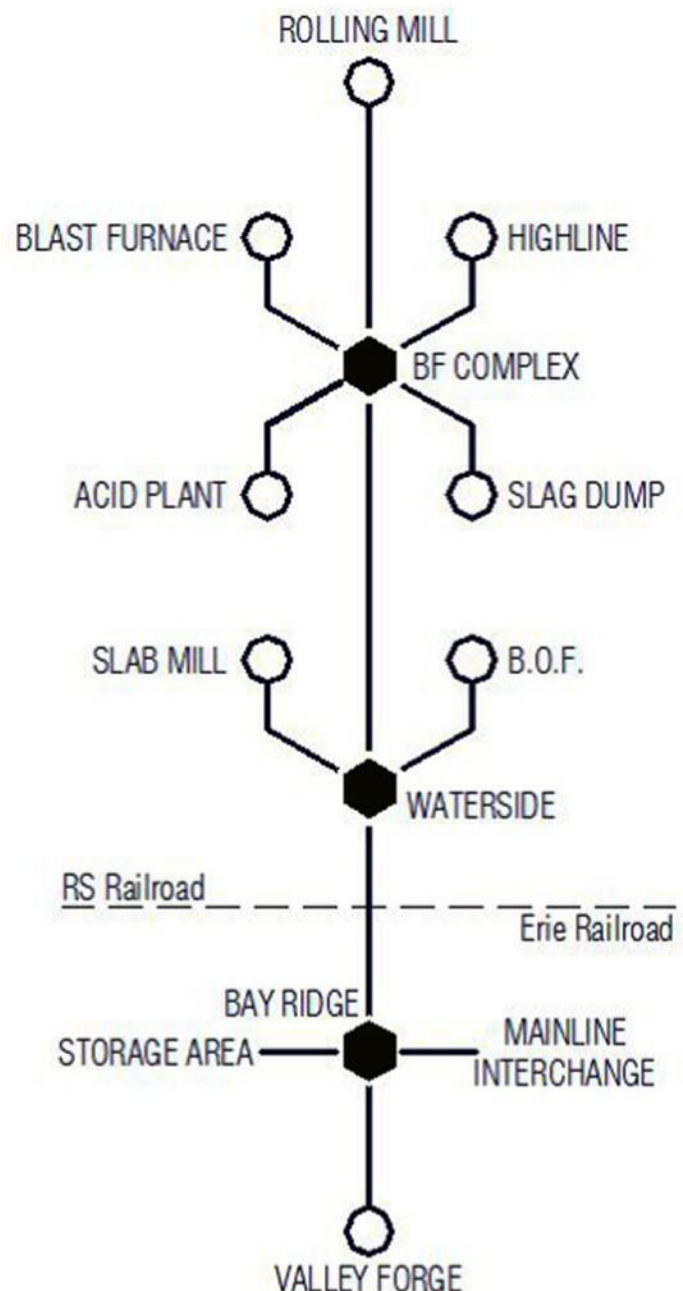
Our problem is that while there is a wealth of
information for us to determine types of freight cars to use and what numbers are required for the demands of a

3600 Ton Blast Furnace, we have been unable so far to discover in any detail how their movements are organised.

Initial attempts to continue using switch lists were found to be time consuming in their preparation, tedious to operate and inflexible to any changes or variations as our knowledge of steel making increased.

We finally resigned ourselves to accepting it was unrealistic, within the scope our limited resources, to expect any one method of planning to accommodate the difference between running a railroad and at the same time accommodating all the demands of a continuous processing operation.

What we now have is a separate Republic Steel railroad schedule integrated with a conventional Railroad timetable. I will elaborate later on the RS Railroad schedule.

Incorporated in the new timetable are the following considerations:

● Minimise the need during staging to handle rolling stock in order to reduce damage to delicate car fittings.

● Upon completion of a run session for all the cars to be in the correct location ready for the next session.

● Run sessions, excluding breaks, not to exceed five hours.

● Keep the focus on train operation, not documentation.

● An entertaining and stress free run session for three operators.

Step One

An Excel spreadsheet is used to create a simple a bar chart as a means of pulling together all the external Steel Railroad, Short Line and interconnecting Railroad train movements over a typical 12 hour period. At the beginning and end of each bar is a sequence number which in the next stage becomes the train order number. As you look across the sheet you will notice all the movements are in chronological order. This is because most of the layout is restricted to single line working. The omission of a time scale is intentional; this stage is all about developing an overall workable plan.
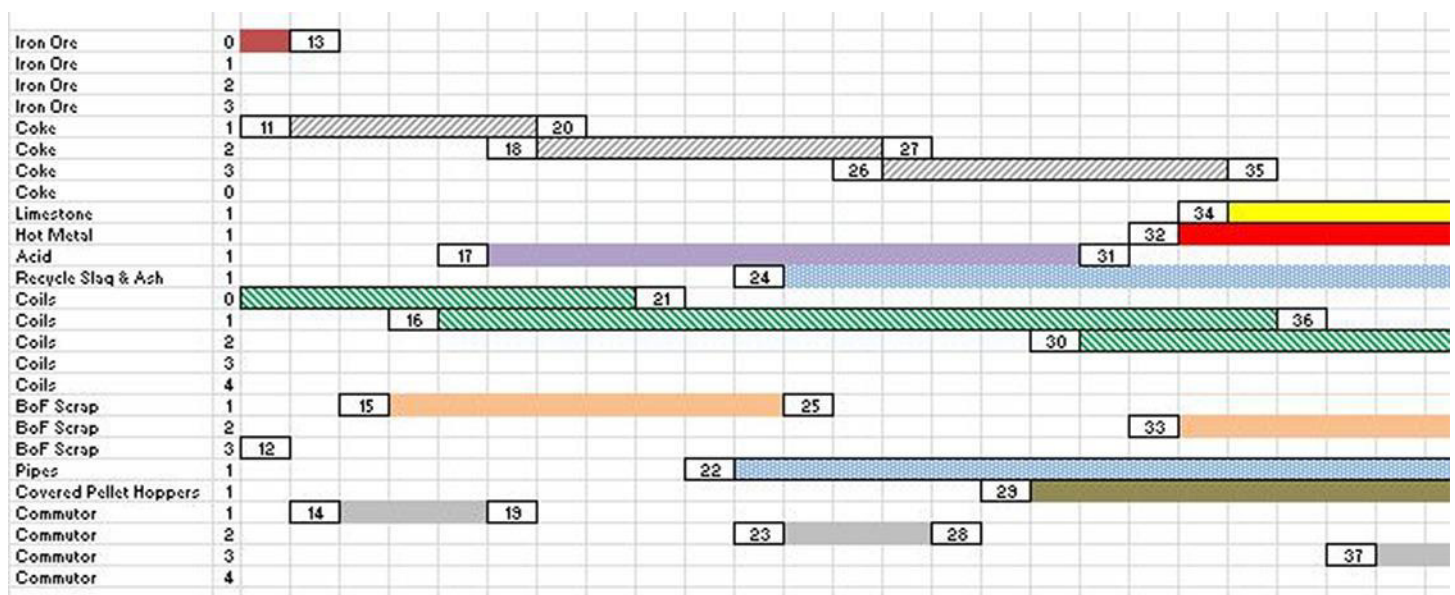
Step Two

Interface between the Bar Chart and Timetable is a variation of a Train Time graph.

Train time graph — vertical axis (top to bottom): Rolling Mill 10, Highline 9, Blast Furnace 8, Slag Dump 7, B.O.F. 6, Slab Mill 5, Waterside 4, New Jersey 3, Bay Ridge 2, 1, Valley Forge 0. Horizontal axis: times from 6:00 to 8:40 in four-minute intervals.
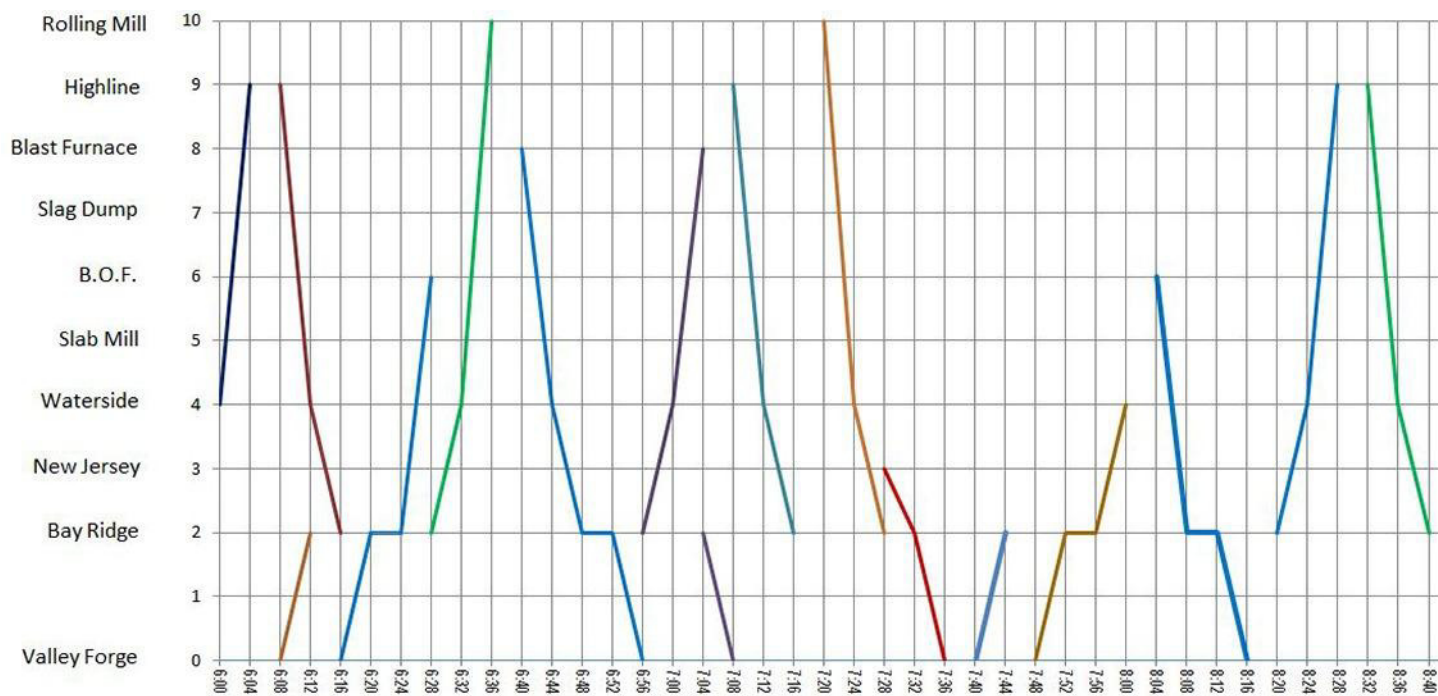
Train time graphs are ideal for this application, however, to be really effective, the graph has to be dynamic. Over the years I have read abstracts on the internet and an article in *Model Railroader* of how people created their own dynamic time graphs using the Excel X-Y scatter chart. This is not for the faint hearted, but the end result is well worth the effort.

Direction	1	0	0	1	1	1	0	1	0	0	0	0	1	1	0	1	0	0	1	1
Train No.	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
6:00	4	2																		
6:04	9	0																		
6:08				9	0															
6:12				4	2															
6:16				2		0														
6:20						2														
6:24						2														
6:28						6	2													
6:32							4													
6:36							10													
6:40								8												
6:44								4												
6:48								2												
6:52								2												
6:56								0	2											
7:00									4											
7:04									8	2										
7:08									0	9										
7:12										4										

Reference

Rolling Mill	10
Highline	9
Blast Furnace	8
Slag Dump	7
B.O.F.	6
Slab Mill	5
Waterside	4
New Jersey	3
Bay Ridge	2
Dummy	1
Valley Forge	0

Direction
1 Westbound
0 Eastbound

I have avoided the complexities of different time and speed gradients by adopting one common unit of time.

The timetable is compiled in four minute 'real time' increments, which is typically how long most movements take, including set-out.

In columns across the chart data source spreadsheet (See previous page) are 'Train Order Numbers' in chronological order. Down the left hand side is 'Time' in four minute increments. Each yard or destination is given a number, or as I read in one article, what the author referred to as 'mileposts'.

At the intersection between the respective Train Order column and required time row enter the milepost number. Continue then to work down the same column and enter all the milepost numbers from which the train starts, passes through and terminates. Do not worry about timing accuracy as these are easily changed and are often altered later as you refine the schedule. As you enter train times, you can switch to and from the Train Graph to see how the programme is developing. Why I am so keen on using a Train Time graph is it clearly shows any conflicts of single line operation and opportunities to tighten or slacken the schedule as you see fit. To make any changes, go back to the data sheet and move the respective train order milepost up or down to suit. As the train times are being entered so a 0 or 1 is entered at the top of the same column. These are to tell the timetable the direction of travel.

The Timetable
This is another excel sheet in the same file and dependent upon the Train Time Graph Data Sheet.

Timetable planning input is about presentation and clarity. Times automatically appear as you enter the train order numbers.

Timetable No.5.0 — WESTBOUND Read Down (1)

Station		Coke (1) 11	Commutor (1A) 14	B.O.F. Scrap (1) 15	Coils MT (1) 16	Coke (2) 18	Commutor (2A) 23	Recycle Slag & Furnace Ash MT 24	Coke (3) 26	Covered Pellet Hoppers 29	Coils MT (2) 30	Acid MT 31
Valley Forge	LV		6:08	6:16			7:40	7:48		8:48		9:04
Bay Ridge	AR		6:12	6:20			7:44	7:52				9:08
Bay Ridge	LV			6:24	6:28	6:56		7:56	8:20		8:56	9:12
New Jersey	LV									8:52		
Waterside	LV	6:00			6:32	7:00		8:00	8:24		9:00	9:16
B.O.F.	AR			6:28								
Blast Furnace	AR					7:04						9:20
Highline	AR	6:04							8:28			
Rolling Mill	AR				6:36						9:04	

Timetable No.5.0 — EASTBOUND Read Down (0)

Station		B.O.F. Scrap MT 12	Iron Ore MT 13	Acid 17	Commutor (1B) 19	Coke (1) MT 20	Coils (1) 21	Pipes MT 22	B.O.F. Scrap MT 25	Coke (2) MT 27	Commutor (2B) 28	Hot Metal 32
Rolling Mill	LV							7:20				
Highline	LV		6:08			7:08				8:32		
Blast Furnace	LV			6:40								9:24
B.O.F.	LV								8:04			
Waterside	LV		6:12	6:44			7:12	7:24		8:36		9:28
New Jersey	LV							7:28				
Bay Ridge	AR		6:16	6:48			7:16	7:28	8:08	8:40		9:32
Bay Ridge	LV	6:00		6:52	7:04			7:32	8:12		8:44	9:36
Valley Forge	AR	6:04		6:56	7:08			7:36	8:16		8:48	9:40

It is never too late to make a change; just go back to the chart data sheet and move the times accordingly then check the graph to see if and how the change has impacted on other movements.

Operators Timetable

The abbreviated heading above each Train Order is a prompt to the operator as to the train consist. As I mentioned earlier, most are block trains with the same type and number of cars and therefore quickly memorised.

There is a supporting list of manually generated Train Orders detailing only the most basic information such as;

- Car type(s)

- Number of cars

- Loaded or empty

- Pick up and set out

No reference is made to arrival or departure times or individual car numbers.

Copy of Train Order No.32

32	From: **Blast Furnace**				To: **Valley Forge**		
	Industry	Pickup	Qty		Setout	Qty	
Rolling Mill							
Blast Furnace	Blast Furnace	Hot Metal Cars 160T Spacer Cars	2 3	L			
Waterside	Interchange						
Bay Ridge	Interchange	Caboose	1				
Valley Forge	Pipe & Forge				Hot Metal Cars 160T Spacer Cars Caboose	2 3 1	L
New Jersey							

Republic Steel Schedule

The Republic Steel schedule is predicated on our assumption timing of steel production is process driven. The schedule is based on the blast furnace being tapped every three hours; dividing the operating session into four time periods.

Internal movements within each time period are in no strict order and authorised by agreement between the Blast Furnace and Waterside Operators.

Departures and arrivals between Waterside, Bay Ridge and onwards are subject to timetable operation. Internal movements prior to departure and after arrival are by agreement between the Blast Furnace and Waterside Operators.

Train order numbers shown down the right hand side in italics are solely for the benefit of the Waterside Operator to save time constantly referencing the timetable. In practice, the Waterside Operator acts as the Republic Steel Dispatcher

This sheet is prepared manually once the Railroad 'Timetable' has been finalized.

Republic Steel Internal & Connected Movements

Time	Journey	Car Type	Qty		Train Order
6:00	Waterside to Highline	Coke Hoppers	12	L	*11*
	B.O.F. to Slab Mill	Ingots	6	L	
6:16	Highline to Waterside	Ore Hoppers	15	E	*13*
	Slab Mill to Rolling Mill	Slab Flatcars	5	L	
6:36	Waterside to Rolling Mill	Coil Cars	5	E	*16*
	Blast Furnace to B.O.F.	Hot Metal Cars 240T	2	L	
6:44	Acid Terminal	Acid Tankcars	6	L	**17**
	Blast Furnace to Slag Dump	Slag Ladle Cars	6	L	
7:04	Waterside to Highline	Coke Hoppers	12	L	*18*
7:12	Highline to Waterside	Coke Hoppers	12	E	*20*
	Blast Furnace to B.O.F.	Furnace Spill Gondolas	2	L	
	Slab Mill to B.O.F.	Ingots	6	E	
7:24	Rolling Mill to Waterside	Coil Cars	5	L	*21*
	B.O.F. to Blast Furnace	Hot Metal Cars 240T	2	E	

Session Clock

We use an excellent fast clock app which our third operator, John Maker set up on an tablet next to the Bay Ridge Operator. This is connected to a large wall mounted monitor visible anywhere in layout room. The clock operates in real time set to start at 06:00 coincidental with start of the session 'Timetable'. Depending upon how the session is progressing, we will pause or advance the clock synchronous with the 'Timetable'.

Summary

Why go to all of the trouble to develop a 'Timetable' that is essentially an extension of a sequence operating system?

- First and foremost it eliminates undue pressure and stress if there is variation in operator proficiency.

- With known times and a session clock, each operator can think through the schedule and prepare for moves in advance.

Not wanting to distract or deter interest in timetable development, I have refrained from any detailed spreadsheet explanation. Please contact me for more details if you have a genuine interest in using this method to develop your own timetable.

Disclaimer: any resemblance of the above to prototypical operation is purely coincidental.
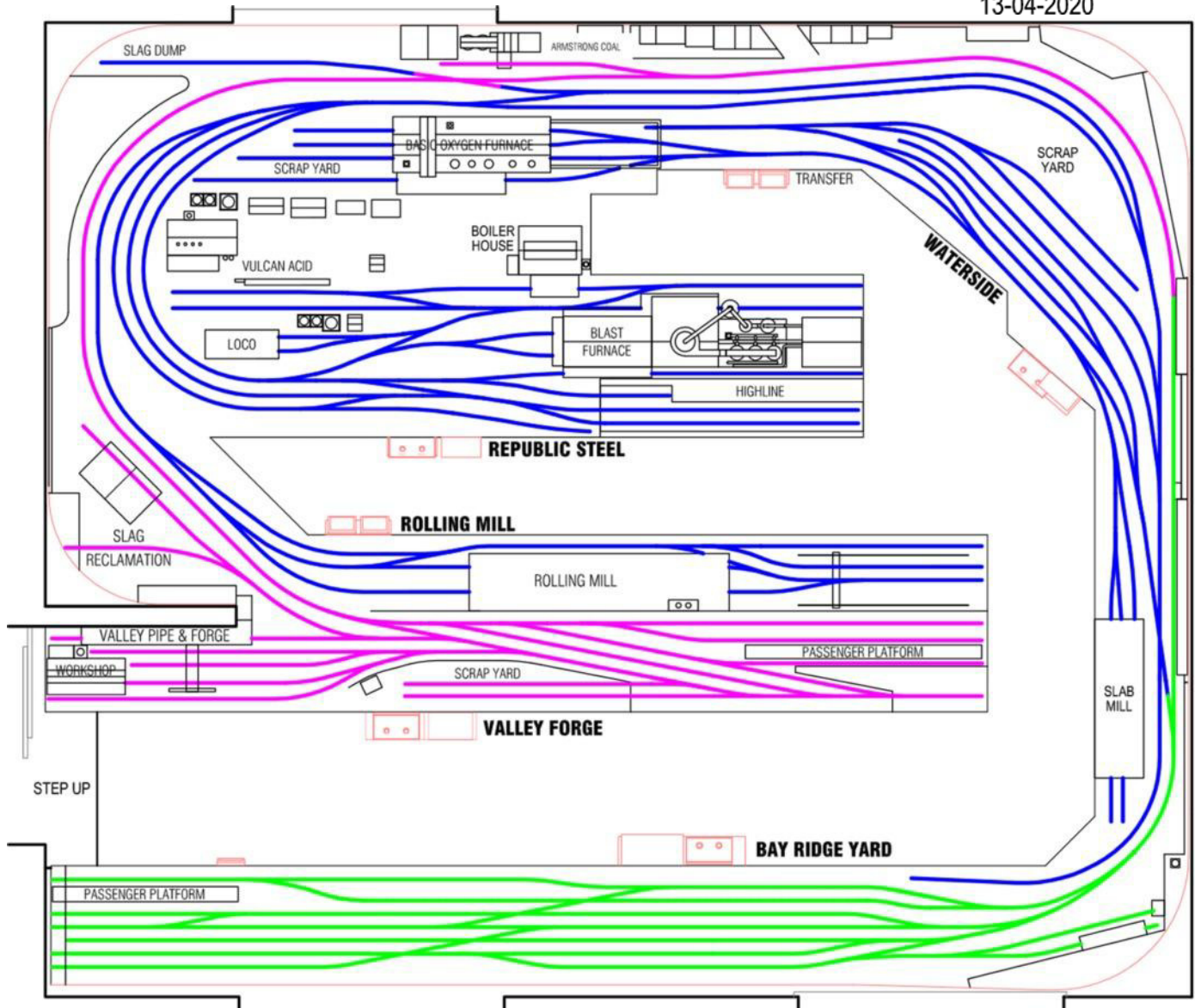
Get out of your continuous circle, give it a go; operating to a timetable makes for an enjoyable and stimulating run session.

YULAN VALLEY RAILROAD
OPERATION PLANNING

By Bruce Temperley

Editors Note: Neville Rossiter has inspired many of us through the years. What follows is his mate, Bruce Temperley's, explanation of the Yulan Valley's operations and planning.

As we drew near to completing extensive layout alterations and construction of the Blast Furnace extension, the question to address was how were we to operate the new Iron and Steel Railroad?

Working through all the outstanding wiring and scenery, there was little time to explore and evaluate commercially available options. Besides which, what exactly would we need?

Current track Plan:
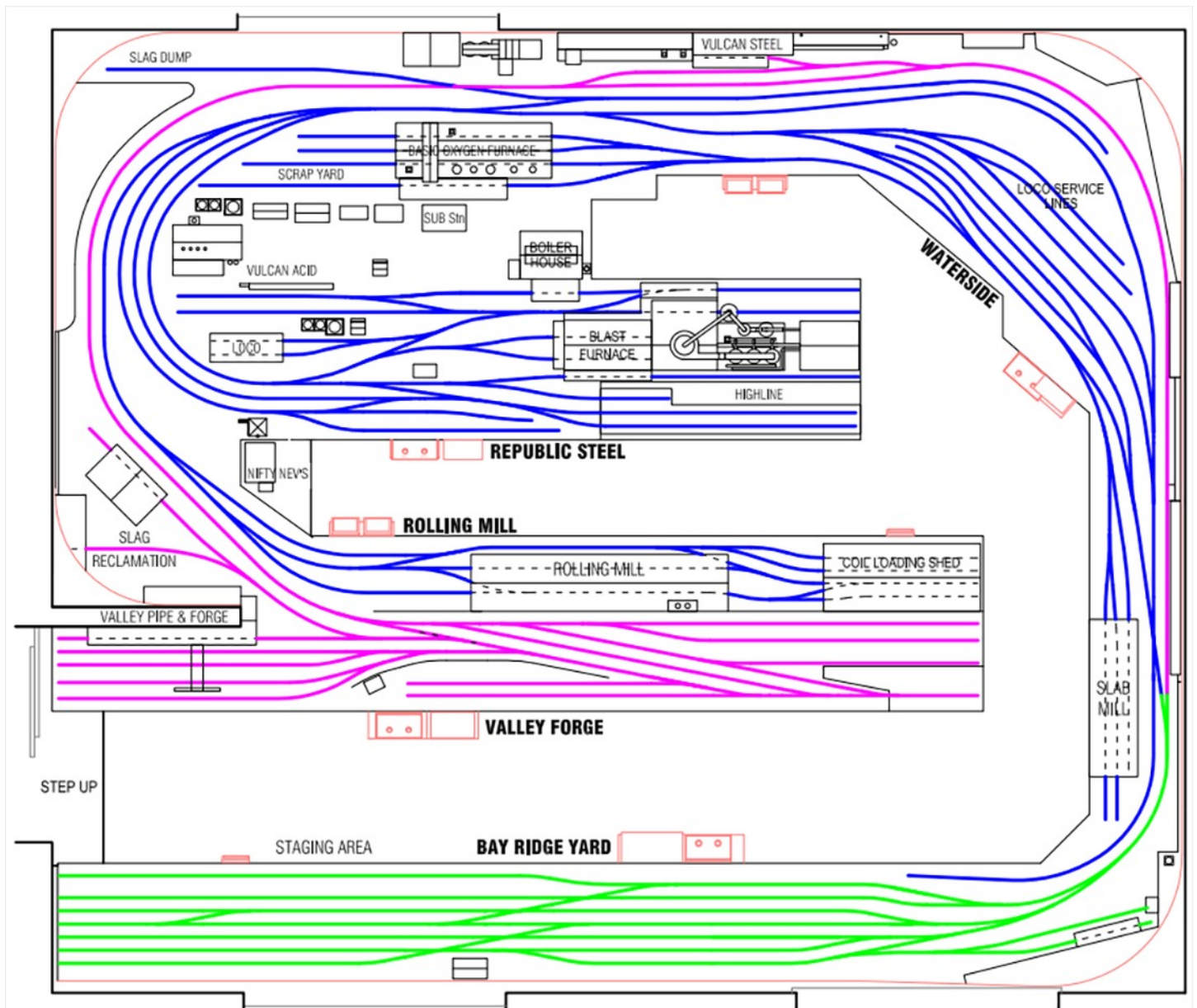
The current layout comprises three operating districts shown on the plan in three distinguishing colours. Bay Ridge shown with green track, represents a mainline junction for connections to Valley Forge and 'offboard' locations.

Waterside is the gateway to all steel manufacturing activities connected by the blue track.

The dark pink track is a continuation of the Yulan Valley Railroad through Bay Ridge to Valley Forge.

There are numerous excellent books and articles on Iron and Steel railroads, but I have not found one on the detail of daily operation. So where to start? After some rudimentary research, I compiled a spreadsheet, to assess the variety and volume of traffic generated by a typical Iron and Steel complex. This proved to be an invaluable aid in getting a handle on numbers and frequency of daily movements.

Other considerations in preparing an operating plan:

  • Minimum handling of stock to avoid damage and breakage of delicate parts.

  • The next session continues on from the last without need to re-stage.

  • To keep operators engaged in a steady flow of activities without anxiety or stress.

  • Each complete operating session to last no longer than four to four and a half hours.

Demands of an Iron and Steel operation did not sit comfortably with any of the planning techniques I had used in previous BRHRR iterations. I finally decided upon a basic spreadsheet bar chart supported by features extracted from some of my earlier programs.

Section of Bar chart for Iron and Steel Operation:

Session Plan 3A

				T.O	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Republic Steel				V0	ri	out	in	ro	out	in	out	in	out	ro	In	Out	In	Out	In
Blast Furnace	BOF (A)	Molten Iron	Hot Metal Car (16 Wheel)				3												
Blast Furnace	BOF (B)	Molten Iron	Hot Metal Car (16 Wheel)		3														
Blast Furnace	Valley Forge	Molten Iron	Hot Metal Car (12 Wheel)														3		
Highline	NJ via Bay Ridge	Iron Ore	Iron Ore Hoppers				15									15			
Highline	NJ via Bay Ridge	Coke	Coke Hoppers										8						
Highline	NJ via Bay Ridge	Limestone	Limestone Gondolas																
BOF	NJ via Bay Ridge	Crushed Limestone	2 Bay Closed Hopper																
Slag Dump	Valley Forge	Recycle Slag	Side Dump Cars								6								
Blast Furnace	Valley Forge	Furnace Ash	Covered Hoppers								3								
Vulcan Acid Plant	Valley Forge	Acid	Vulcan Tankcars																8
Rolling Mill	NJ via Bay Ridge	Coils	Coil Cars							6									
Rolling Mill	Bay Ridge	Coils	Covered Coil Cars																
BOF	Valley Forge	Molten Steel	Open Top Hot Metal															7	
BOF	Valley Forge	BOF Process Scrap	Scrap Gondolas												5				
Lime Dusting	NJ via Bay Ridge	Powdered Lime	Boxcars									2							
Boiler Plant	NJ via Bay Ridge	Boiler Coal	Open Hoppers									3							
Loco Depot	NJ via Bay Ridge	Loco Fuel	Tankcar									1							
Loco Depot	NJ via Bay Ridge	Loco Sand	Closed Sand Hopper									1							
Vulcan Chemicals	NJ via Bay Ridge	Packaging	Boxcars									2							
Slab Mill	NJ via Bay Ridge	Export Slabs	Covered Gondolas			4													
BOF	Slab Mill	Ingots	Ingot Flat Cars												10				
Slab Mill	Rolling Mill	Steel Slabs	Slab Flatcars												5				
Rolling Mill	BOF	PUP Scrap	Short Gondola												2				
Blast Furnace	BOF	Furnace Spill	Pancar												2				

There are two bar charts, one for Iron and Steel internal and external movements, and another for Valley Forge inwards and outwards traffic. The common link being they all interconnect through Bay Ridge which also includes staging for the entire layout.

Each bar chart is divided into forty columns. Each column is numbered. Near the top of each column is a box to enter if the movement is IN or OUT, with a distinction for Iron and Steel activities.

In a column down the left-hand side are single line descriptions to reflect the train consist, such as Hot Metal Cars, Iron Ore Hoppers or Coil Cars.

On top of an already busy schedule is the constraint of 'single line working' between operating centres. Iron and Steel demands are always given priority.

Valley Forge traffic, with the exception of Hot Metal consignments, are scheduled to coincide with internal Iron and Steel activities.

Section of Bar chart for Valley Forge Operation:

Valley Forge - Plan 3A				T.O	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
				I/O	in	out	out	out	out	in	in	in	out	in	out	in	out	in	out
Pipe & Forge Co	Blast Furnace	Molten Iron	Hot Metal Car (12 Wheel)														3		
Pipe & Forge Co	BOF	Molten Steel	Open Top Hot Metal															5	
Vulcan Steel	BOF	Molten Steel	Open Top Hot Metal															2	
Pipe & Forge Co	Acid Plant	Acid	Vulcan Tankcars																8
Aggregate Plant	Slag Dump	Recycle Slag	Side Dump Cars								6								
Aggregate Plant	Blast Furnace	Furnace Ash	Covered Hoppers								3								
MidWest Scrap	BOF	BOF Process Scrap	Scrap Gondolas						5										
Vulcan Steel	NJ via Bay Ridge	Boiler Coal	Open Hoppers											3					
Aggregate Plant	NJ via Bay Ridge	Aggregate	Closed Hoppers		6														
Pipe & Forge Co	NJ via Bay Ridge	Pipes	Pipe Flatcars						4										
Workshop	NJ via Bay Ridge	Machinery	Boxcars											2					
Workshop	NJ via Bay Ridge	Machinery	Gondola																
Workshop	NJ via Bay Ridge	Machinery	Flatcar																
Team Track	NJ via Bay Ridge	Mixed Freight	Boxcars											2					
Team Track	NJ via Bay Ridge	Mixed Freight	Gondola											1					
Team Track	NJ via Bay Ridge	Mixed Freight	Flatcar																

In a similar format beneath each planning chart is a dynamic record of how many cars are at each location at any time. Discrepancies such as non-availability of cars or too many, at any one time under the Blast Furnace or on the High Line, are flagged for the Planner's attention.

Section of Iron and Steel Operation Stock Balance:

Republic Steel Balance				Open	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Blast Furnace	BOF (A)	Molten Iron	Hot Metal Car (16 Wheel)	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0
Blast Furnace	BOF (B)	Molten Iron	Hot Metal Car (16 Wheel)	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Blast Furnace	Valley Forge	Molten Iron	Hot Metal Car (12 Wheel)	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3
Highline	NJ via Bay Ridge	Iron Ore	Iron Ore Hoppers	0	0	0	15	15	15	15	15	15	15	15	15	0	0	0	0
Highline	NJ via Bay Ridge	Coke	Coke Hoppers	0	0	0	0	0	0	0	0	8	8	8	8	8	8	8	8
Highline	NJ via Bay Ridge	Limestone	Limestone Gondolas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BOF	NJ via Bay Ridge	Crushed Limestone	2 Bay Closed Hopper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slag Dump	Valley Forge	Recycle Slag	Side Dump Cars	6	6	6	6	6	6	6	0	0	0	0	0	0	0	0	0
Blast Furnace	Valley Forge	Furnace Ash	Covered Hoppers	3	3	3	3	3	3	3	0	0	0	0	0	0	0	0	0
Vulcan Acid Plant	Valley Forge	Acid	Vulcan Tankcars	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Rolling Mill	NJ via Bay Ridge	Coils	Coil Cars	6	6	6	6	6	0	0	0	0	0	0	0	0	0	0	0
Rolling Mill	Bay Ridge	Coils	Covered Coil Cars	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BOF	Valley Forge	Molten Steel	Open Top Hot Metal	7	7	7	7	7	7	7	7	7	7	7	7	7	7	0	0
BOF	Valley Forge	BOF Process Scrap	Scrap Gondolas	0	0	0	0	0	0	0	0	0	0	0	5	5	5	5	5
Lime Dusting	NJ via Bay Ridge	Powdered Lime	Boxcars	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2
Boiler Plant	NJ via Bay Ridge	Boiler Coal	Open Hoppers	0	0	0	0	0	0	3	3	3	3	3	3	3	3	3	3
Loco Depot	NJ via Bay Ridge	Loco Fuel	Tankcar	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
Loco Depot	NJ via Bay Ridge	Loco Sand	Closed Sand Hopper	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
Vulcan Chemicals	NJ via Bay Ridge	Packaging	Boxcars	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2
Slab Mill	NJ via Bay Ridge	Export Slabs	Covered Gondolas	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BOF	Slab Mill	Ingots	Ingot Flat Cars	10	10	10	10	10	10	10	10	10	10	0	0	0	0	0	0
Slab Mill	Rolling Mill	Steel Slabs	Slab Flatcars	5	5	5	5	5	5	5	5	5	5	0	0	0	0	0	0
Rolling Mill	BOF	PUP Scrap	Short Gondola	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0
Blast Furnace	BOF	Furnace Spill	Pancar	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0

Of equal importance to the 'Plan' is the presentation and clarity of information handed to the Operators.

Beneath each train order are condensed details of Destination, Origin, Load, Car type, load status and how many cars. Refinements such as Railroads and individual car numbers are omitted as most consists are run as block trains. There is also some licence taken in our abbreviated description of car types.

There are forty Train Orders automatically linked to each Planning Bar Chart. Each Train Order corresponds with the respective Bar Chart column number.

Section of Operator's Train Orders:

Blast Furnace & Rolling Mill Plan 3A

Train Order 1		RS INWARDS			Cars
Blast Furnace	BOF (B)	Molten Iron	Hot Metal Car (16 Wheel)	MT	3
Train Order 2		**OUTWARDS**			**Cars**
Slab Mill	NJ via Bay Ridge	Export Slabs	Covered Gondolas	Load	4
Train Order 3		**INWARDS**			**Cars**
Highline	NJ via Bay Ridge	Iron Ore	Iron Ore Hoppers	Load	15
Train Order 4		**RS OUTWARDS**			**Cars**
Blast Furnace	BOF (A)	Molten Iron	Hot Metal Car (16 Wheel)	Load	3
Train Order 5		**OUTWARDS**			**Cars**
Rolling Mill	NJ via Bay Ridge	Coils	Coil Cars	Load	6
Train Order 6		**INWARDS**			**Cars**
Lime Dusting	NJ via Bay Ridge	Powdered Lime	Boxcars	Load	2
Boiler Plant	NJ via Bay Ridge	Boiler Coal	Open Hoppers	Load	3
Loco Depot	NJ via Bay Ridge	Loco Fuel	Tankcar	Load	1
Loco Depot	NJ via Bay Ridge	Loco Sand	Closed Sand Hopper	Load	1
Vulcan Chemicals	NJ via Bay Ridge	Packaging	Boxcars	Load	2
Train Order 7		**OUTWARDS**			**Cars**
Slag Dump	Valley Forge	Recycle Slag	Side Dump Cars	Load	6
Blast Furnace	Valley Forge	Furnace Ash	Covered Hoppers	Load	3
Train Order 8		**INWARDS**			**Cars**
Highline	NJ via Bay Ridge	Coke	Coke Hoppers	Load	8
Train Order 10		**RS OUTWARDS**			**Cars**
BOF	Slab Mill	Ingots	Ingot Flat Cars	Load	10
Rolling Mill	Slab Mill	Steel Slabs	Slab Flatcars	MT	5
Rolling Mill	BOF	PUP Scrap	Short Gondola	Load	2
Blast Furnace	BOF	Furnace Spill	Pancar	Load	2
Train Order 11		**INWARDS**			**Cars**
BOF	Valley Forge	BOF Process Scrap	Scrap Gondolas	Load	5
Train Order 12		**OUTWARDS**			**Cars**
Highline	NJ via Bay Ridge	Iron Ore	Iron Ore Hoppers	MT	15
Train Order 13		**INWARDS**			**Cars**
Blast Furnace	Valley Forge	Molten Iron	Hot Metal Car (12 Wheel)	MT	3
Train Order 14		**OUTWARDS**			**Cars**
BOF	Valley Forge	Molten Steel	Open Top Hot Metal	Load	7
Train Order 15		**INWARDS**			**Cars**
Vulcan Acid Plant	Valley Forge	Acid	Vulcan Tankcars	MT	8

Along the top row of each Train Order the Operator is told if the movement is Inwards or Outwards. This information is taken automatically from the direction entered in the box above the respective Train Order column. The same reference also changes each load appropriate for the direction of travel.

Car quantities entered on the Bar Chart are also automatically repeated on the respective Train Order.

Other static Train Order information is automatically copied down from the first Train Order to simplify any global changes.

Each sheet of Train Orders has two buttons as a spreadsheet 'Filter' shortcut. These are used to refresh after any changes. 'Open' as the name implies opens up everything on the

Republic Steel
OPEN

Republic Steel
CLOSE

sheet. 'Close' hides all except active Train Orders and relative information such as destination, origin, Load if applicable, car type, whether loaded or empty and the quantity of cars to be being moved. Copies in this format are printed and handed to the respective yard operators.

As an aside comment, why the restriction on session duration? The duration excludes lunch and numerous tea breaks. Perhaps a reflection on our vintage, but after this length of time there is a noticeable increase in operator mishaps!

This spreadsheet continues to be refined and has sustained enjoyable almost weekly operation for several years.

Given time and inclination, further development is required for the benefit of the Bay Ridge operator.

Author Bruce Temperley working the Yulan Valley Railroad.