

## **QUESTIONS AND ANSWERS FROM Jr.FLL and FLL Teams who participated on the Port of Portland Dock and Airport tours on 11/11/09.**

### **How tall are our cranes?**

Panamax cranes: Container cranes that service ships up to 108' in breadth (the widest ships that can currently navigate the Panama Canal) are 220' high with the boom down. With the boom up in the stowed position the crane is 300' high. The operator sits 100' above the dock.

Post Panamax cranes (those on the east end of the T6 pier that can service larger ships are 195' high when working with the boom down. With the boom up in the stowed position the crane height is 305'. The operator sits 110' above the dock.

The Port has eleven cranes: two Panamax cranes at Terminal 2, and five Panamax and four post-Panamax cranes at Terminal 6.

### **How much do our cranes weigh?**

Cranes weigh around 1200 to 1400 metric tons. That's 3,085,600 lbs., eight blue whales or 1/100<sup>th</sup> of a Nimitz class aircraft carrier!

### **How much power does it take to move the cranes?**

The Port's electric cranes generate no emissions, and over half of the Port's power comes from certified renewable sources. The panamax cranes operate on 2400 volts and the post-panamax cranes operate on 4160 volts.

That power is used to lift the cargo off the ship and run the crane along the rails. Eight electric motors on the feet of the crane drive the wheels through a set of reduction gears that slow down the rotational speed of the motors and increase torque at the drive wheels to get the heavy crane to move. Kind of like first or low gear on your bike or parents' car...except WAY lower.

### **What does the large wheel do?**

The large wheel on the side of the crane is a storage wheel for the cable that supplies electrical power to the crane electrical motors. The storage wheel operates like your household vacuum cleaner electrical cord when you pull out more cord to reach across a room. It allows the container crane to travel up and down the dock without getting tangled up or running over it.

### **How do the container locking systems on the spreaders work?**

The “twist locks” are bayonet type pins that lock into pockets on the top of the containers at all four corners to lift the containers and move them from the ship to the dock.



### **How does the crane’s elevator work?**

The elevator works on a rack-and-pinion gear similar to the steering on most new automobiles.



### **What is the maximum container weight?**

The maximum container weight is 40 short tons, or 80,000 lbs. The weight restriction allows loaded containers to be stacked 6 high and for trucks to carry them on our roadways

### **How long does it take to navigate from the mouth of the Columbia to T6?**

It takes two hours for ships to transit from the bar pilot pick-up area offshore, over the bar at the mouth of the Columbia to Astoria where new river pilot comes on board. The rest of the 103 mile river transit takes approximately 6 hours at a comfortable 12 knots (nautical miles per hour)

Here is a chart of the entrance to the river:

<http://www.oceangrafix.com/o.g/Charts/chartViewer.html?viewRegion=Pacific&viewChart=Columbia-River-Pacific-Ocean-to-Harrington-Point>

It takes five charts to navigate the river up to T-6:

<http://www.oceangrafix.com/o.g/Charts/chartViewer.html?viewRegion=Pacific&viewChart=Columbia-River-Saint-Helens-to-Vancouver>

### **What is the TEU (size range), from biggest to smallest, calling on Portland?**

Well, the smallest TEU (twenty-foot equivalent unit) size is a load of one...but that wouldn't be very practical for the expense of shipping. Barges frequently visit T-6 and can handle as many as 100 TEU for trips up the river to smaller ports.

One of the biggest vessels we could take at T-6 is something like the *Hanjin Chongqing* at more than 6,500 TEU.



#### Specifications:

- Weight: 80,800 DWT (Dead Weight Ton)
- Container Loadable Capacity: 6,655 TEU
- Engine Output: 93,000 HP
- Width: 131 ft,
- Length: 980 Ft (Twice as large as a football stadium)

-Draft : 41 feet

### **Have there ever been any vessels damaged while crossing the bar? Spills?**

None in recent memory. Marine navigation is much more advanced than it was 100, or even 25 years ago. Highly skilled Columbia Bar Pilots use tools like GPS locators and more reliable propulsion systems to assure a much safer trip.

This web site is all about the Columbia River Bar Pilots: <http://www.columbiariverbarpilots.com/>

### **How many people crew one of these big vessels.**

The typical crew of a vessel visiting the Port of Portland is 16-22 sailors. Some pilot the boat from the bridge, others monitor the engine, and some perform maintenance, clean and cook food.

Most sailors come from Pacific Island nations like Vanuatu and the Philippines.

### **What kind of power does the vessel use?**

The ship makes its own electricity from generators using power from either the main diesel engine or a smaller auxiliary diesel generator. The electricity is made just like it is at a large power plant or a wind turbine, rotating a coil of wire in a magnetic field.



A 16 cylinder diesel generator onboard a ship

**What do the small cranes on grain ships do?**

The small cranes, called ship's gear, can help load small cargo for the crew and other small tasks, but mostly they are used to take the hatch covers off the holds (cargo spaces)

**How are cargo hatches operated on a grain ship?**

If a bulk ship doesn't have cranes to help with the hatches, they can be opened with the push of a button and a hydraulic system or electric motor that moves the hatches on rails out of the way.

**Do fireworks come through T6?**

No, but they could. There are very stringent requirements to import potentially hazardous cargo like fireworks.

**Would elevator parts be containerized?**

Indeed they would.