

## **Engine House Audio Tour**

### **Chapter 12, Stop 11**

#### **5:01**

If you have accessibility needs, there is a door on the west side of the building that leads to an accessible elevator. The Engine House is one of the oldest buildings on the site, dating back to 1892. It is constructed of bricks made at the Tower Brickworks in Tower, MN at the turn of the century. In the early underground mining days, it housed hoists for various shafts on the property. It was also operated by steam power until 1924, when the mine converted to electricity. The Engine House continued to contain three important items to the operation of the mine – the electric vault, the air compressor, and the hoisting system.

The electric vault is located on the south side of the building. This is where all the transformers were housed. You can still see the old transformers. They are no longer connected, as the electric units have been upgraded over time.

The air compressor provided the drills, tuggers, and Eimco loaders with the compressed air they needed to operate. The unit was manufactured by Worthington and it dates back to 1924 when the mine converted from steam to electricity. It is a two stage, water cooled, compressor that yielded about 2900 CFM. The power for the compressor is rated at 500 horse power.

So how does one make compressed air? That is a good question. Air enters the low pressure side of the machine, where it is initially compressed to a regulated pressure. The air then goes through the heat exchanger to the secondary side where it is compressed to 100 pounds of pressure, which is needed for the underground tools. It is pumped to the underground via a 6 inch pipe in the shaft and various receiving tanks at the different levels.

Unfortunately, compressing air creates a lot of heat, which needs to be removed. This is accomplished by the cooling device located outside the engine house and the heat exchanger located above the two pistons. The large cylinder of the heat exchanger is filled with many small tubes. The small tubes carry hot water from the jacket surrounding the pistons. Cool water from the cooling device flows around the outside of the tubes cooling the water inside the small tubes. This hot water is then cooled by the cooler atmosphere outside.

The hoisting system is the final item housed in the Engine House. This hoist, manufactured by Allis Chalmers, dates back to 1924. When the mine converted to electricity, they installed the new hoist, which also operated on electricity, as opposed to steam power.

You may be asking yourself how the hoist works. Are the cages counter-balanced? How does the hoistman know where to stop? Is it safe to ride on the cages? Those are all very good questions. Each cage is connected to a thick 2-½ inch cable. You can see a section of the cable on the railing. The cable is wound around the giant drum, similar to a spool of thread. As the hoistman engages the system, the drum starts to spin. This causes one of the cables to unwind, thus lowering the cage. At the same time the other cable is being wound on the drum, thus

causing the cage to be raised toward the surface. While riding the cages you may notice some “bounce” in the cable. This is the slack of the cable being tightened up. There is a model replica of this process located near the hoistman stand. Feel free to try it out.

The large dials above the hoist drum help the hoistman know when he is approaching a certain level. There are two dials – one for the East cages and one for the West cages. Once the hoistman gets close to the level, he slows the drum down and then he looks at the side of the drum where he has markers for the top and bottom cages on various levels, such as level 27. It is amazing how accurate the hoistman are with the cage positioning.

While the hoistman is raising/lowering the cages, he has many safety features that help him control the cages. The main item is the device known as the “Lilly Control”. It is the red object with two balls. As the hoist operates, the balls begin to spin around. If the hoist is traveling to fast when it leaves the surface area or when it is approaching the surface, the Lilly Control will cut the power to the system. This causes the hoist to stop. When ore is being hauled, they need to disengage the Lilly Control, so they could raise the ore skip high enough above the surface to dump the ore in the Larry Car.

That brings us to the end of the surface tour. We hope you have enjoyed your tour of the surface facilities at Soudan Mine. If you have not gone on an underground mine tour, we highly encourage you to experience that adventure. If you checked out the MP3 player from the visitor center, please return it and look around our fabulous nature store for souvenirs of your journey. Also feel free to enjoy our great hiking trails, participate in our geocaching program or relax in our picnic area. Most importantly, please remember the hard work that these miners did and the sacrifices they made to help Minnesota and our country become the great places they are.

Narrator - James Pointer  
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