Unit 17 Blast furnace

Task 06

Announcer: A guided tour through the “Voest Alpine Stahl Donawitz GMBH”

Narrator: The five apprentices Aniri, Johnny, Lilly, David and Miro and their boss Mr Meier have finally arrived at the “Voest Alpine Stahl Donawitz GMBH” in Donawitz in Styria. They are going to have a guided tour of 3 hours, conducted by qualified staff. The minimum age of a visitor is 15, but since they are already in their first year of apprenticeship, there’s no problem. The tour includes an image film and information material. They are told that taking photos is prohibited and protective shoes must be worn.

They are very excited because they are going to see a real blast furnace. In school, they have learned a lot about pig iron production in a blast furnace. They know about the four different parts of the blast furnace and the pre-processing of iron ore, which does not exist in such a pure form in nature because it only occurs naturally as a chemical compound. However, they’ve only studied this in theory, until today.

Now they are actually standing in front of that huge blast furnace and they are listening to the boss of the department, Mr Huber, who is explaining the processes in the blast furnace.

Mr Huber: Hello everybody! Welcome to our company Voestalpine Stahl Donawitz GmbH. Our famous “Linz Donawitz Verfahren” is the process by which most steel (60%) is produced worldwide. With the help of the LD process, it is possible to economically process large quantities of pig iron and scrap and supply crude steel of special quality. Voestalpine Stahl Donawitz GmbH can look back upon more than 125 years of experience in steelmaking technology. Donawitz has always been and continues to be one of the major names in Austria’s Upper Styrian steelmaking tradition.

So, I’m going to tell you some technical facts about the blast furnace, which you probably already know from school: its parts, the different heating zones and its products. Later, you’ll even experience a pig iron tapping process and you will get a sample of the tapping, a piece of pig iron, which you may keep.

The blast furnace consists of two cone-shaped hollow blocks, one on top of the other, made of fireproof stonework held together by a steel casing. Its height can be about 30–80m and its diameter between 14–20m. It includes the following five parts:

- the blast furnace top with blanking plug
- the chamber
- the carbon-sack
- the bosh and ring line for hot air
- the frame

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In the blast furnace, iron ore is transformed into pig iron through reduction. The starting product to produce pig iron is ore. This iron ore does not exist in its pure form in nature – it occurs always as a chemical compound. The most important iron ore is magnetic iron ore. In order to produce pig iron from iron ore, it is necessary to pre-process the iron ore by breaking up the rough pieces of ore into smaller pieces that fit into the blast furnace and by blasting with hot air, a thermal pre-processing method that reduces or eliminates unwanted elements such as water, carbon dioxide and sulphur.