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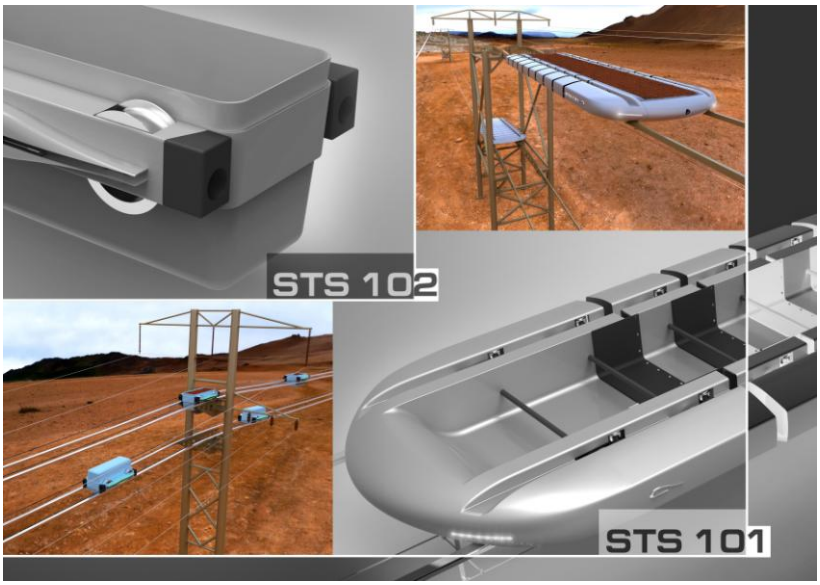
18 November 2010

CONCEPT DESIGN

STS Freight Suspended Transport System with the capacity of 30 million tons per annum

Part 1. Executive Summary



Sydney — Minsk
2010

The List of Major Implementors

STU General Designer, Managing Director of STU Pty Ltd	A.E.Yunitskiy
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The Head of Body Design Department	S.S. Zavalikhin
The Head of Running Gear Design Department	U.U. Dabravolski
The Head of Power Equipment Design Department	A.P. Lashkevich
The Head of Optional Equipment Design Department	S.N. Aliakhnovich
Principal Design Engineer	V.V. Kashynski

Contents

1 Introduction

The purpose of this preliminary design development is to create freight transport system, based on STS technology, which will solve the problem of iron ore transportation in bulk of 30 million tons per annum (with automatic loading and unloading, and iron ore grading if needed).

The project is aimed to work more substantially on technical and economic issues, which determine applicability and relevance of new STS transport system development and organization of its mass production.

The freight transport system is designed to haul small lump, middle lump and lumpy iron ore at a distance of 250km in bulk of 30 million tons per annum in conditions of Australia.

Preliminary design consists of 3 parts:

- Part 1 “Executive Summary”;
- Part 2 “STS 101 Freight Suspended Transport System with Electric Drive Rolling Stock”;
- Part 3 “STS 102 Freight Suspended Transport System with Cable Drive”.

2 The Relevance of Project Development

The world market of iron ore has recently become one of the most fast-growing markets. In terms of volume sales it is one of the largest mineral markets, its sales stand down only to oil and coal markets. World reserves of iron ore (see Fig.1) are concentrated in 6 countries. In particular (according to USGS, Metal Research), in Ukraine (20%), in Russia (16%), in China (14%), in Australia (12%) and in Brazil (10%).

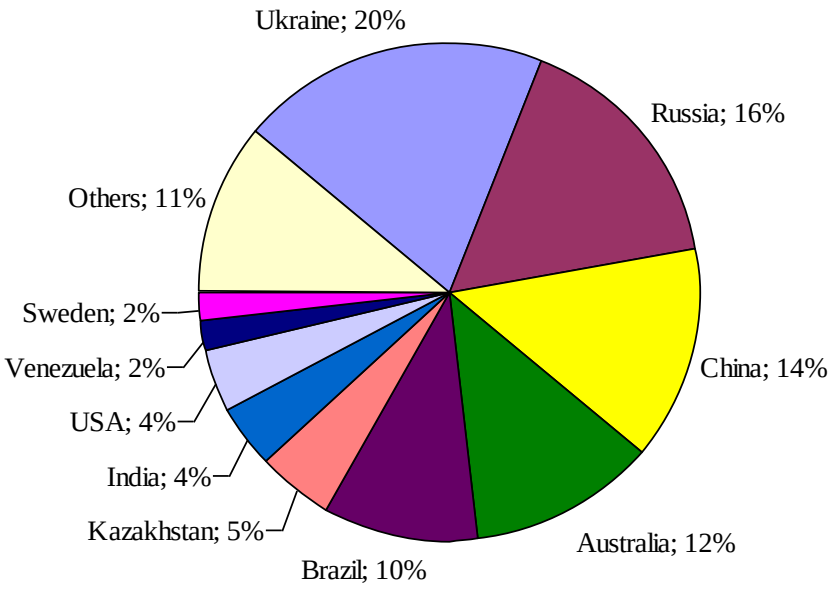

Fig. 1. Iron ore reserves around the world (January, 2010)

More than 2 billion tons of iron ore is produced in the world every year. In 2009 the extraction of ore has increased by 5% and now is amounted to 2.3 billion of tons. The structure of iron ore extraction in different countries in 2009 is represented in Fig.2 (according to USGS, Metal Research). The largest producer of iron ore is China. More than 40% of iron ore in the world is produced there. Besides, the largest producers of iron ore are Brazil (16%), Australia (16%) and India (11%).

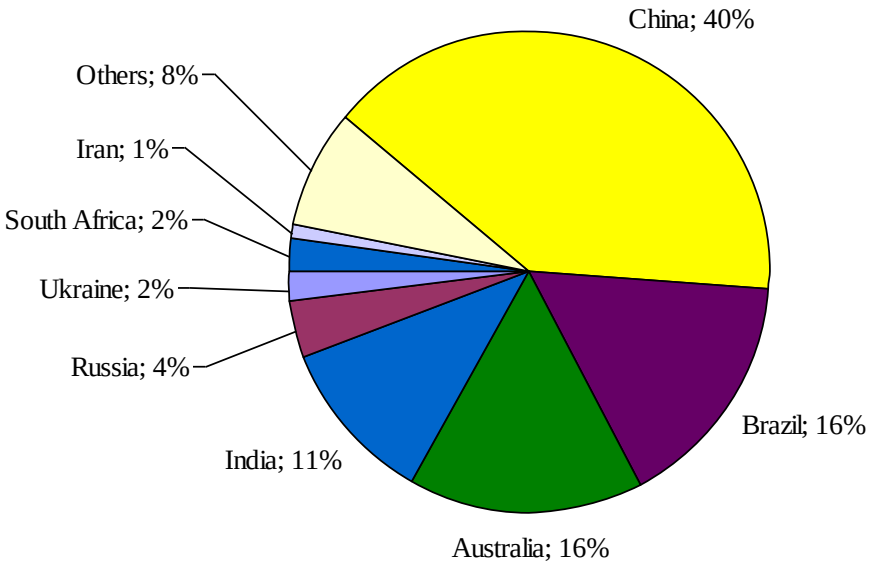

Fig. 2. The structure of iron ore extraction around the world in 2009.

The main engine of global iron ore trade is the development of metallurgical production in the countries of East Asia, which are not provided with their own raw materials to the full extent. China plays the key role. Iron ore is most often used for the production of cast ore and direct reduced iron products (basic materials together with charcoal used in the smelting of crude steel).

Traditionally the main iron ore supplies in the world are carried through the contracts and prices, concluded between Japan and EU metallurgic industry and Brazilian (Vale) and Australian (BHP) mining companies. The price is in cents per % of iron content in dry metric ton. For example, small lump ore BHP Billiton, FOB Australia in 2008 was 144.66 USD cents/ %Fe. China, the world's main importer of iron ore, is forced to accept these prices. However, because of the crisis and market instability, spot prices became of great importance. In March 2010 spot prices for iron ore in China have increased up to $146 per ton. The prices are predicted to increase up to $157.

The price increase can be explained by several factors. One of such factors is lack of production capacity. More time is needed to increase production capacity, due to the fact that the mines are situated at vast distances. It makes the construction of transport infrastructure more expensive.

In such a situation there is an increasing demand for affordable and flexible in operation innovative transport systems, which are easy to install and have low material consumption. And as a result they have lower price than a conventional railway. Freight transport systems, based on STS technology, meet such requirements.

There are several types of STS freight transport system:

- suspended (a rolling stock is hanged up to the bottom of a string-rail structure);
- mounted (a rolling stock is placed on the top of a string-rail structure);

- traction and braking forces are implemented with the help of drive wheels;
- traction and braking forces are implemented with the help of traction cable;
- with electric contact system or without it.