



*UPRAIL  
CORRIDOR  
IS OUTCOME  
OF MINING  
CRISIS!*



WHEREVER  
YOU DO,  
WE WILL BE  
THERE FOR YOU !



**Victor Uzlov**

*M.E. (Engineering), MBA (Distinction)*

*Managing Director & Chairman*

*Looking back over the last 2.5 years, I am glad for the steps we have taken to create a top-notch engineering Company.*

*ADGEX has not only succeeded in completing the products concept design and testing on time but in an effective manner, and has earned respect for its brand among customers, financial institutions, associates and shareholders.*

*The volatile nature of economies in general, poses a key challenge for companies in dealing with the uncertainties. However, I am confident that our core values will provide us with adequate strength to face them. And that's precisely why I believe that ADGEX is poised for a bigger role in the engineering development of the Nation.*

*The current mining crisis is infrastructural, the applicable technologies are outdated and do not provide the required efficiency and economic performance. The major role in the industry plays transport. The haulage cost has already reached 50% and more in the structure of OPEX. Moreover heavy railway is unable to cope with the modern demands of the mining industry. The miners are forced to go deeper into continents in order to reach best deposits. Mountains, gorges and canyons, crossings of water obstacles and national parks completely paralyze the heavy railway.*

*UPRAIL - is a new era in transportation of bulk commodities. ADGEX presents a unique and cost effective elevated transport system - UPRAIL. We have developed a new standard for the mining industry with the ability to operate in remote areas and mountains as well as to overcome significant inclines. The main advantage of UPRAIL is ecological sustainability where it is possible to keep the original appearance of nature and world of wild animals.*

*This booklet was prepared specially for you - our dear partner. Its pages introduce you the full range of competitive and indisputable advantages of UPRAIL. UPRAIL concept design and testing completed as per local (Australian) standards.*

*Going ahead, we will continue our communication with you towards the real projects. ADGEX has highly professional staff and we are able to implement any transport solutions for you.*



2	UPRAIL CORRIDOR
4	TECHNICAL LEADERSHIP
6	ROLLING STOCK, RAILWAY STRUCTURE
8	CAPITAL EXPIDENTURE
10	SAFETY & ENVIRONMENT
12	WATERPROOF SOLUTIONS
15	COMPARATIVE ANALYSIS
16	LOGISTICS CAPABILITIES
18	ALL-WEATHER OPERATIONS
22	TRIPORT
24	MODULAR CONCEPT OF LOCOMOTIVES
26	UPRAIL TESTING TRACK
28	INTELLECTUAL PROPERTY

*IF YOU ARE  
SEEKING  
EFFECTIVE  
HAULAGE  
SOLUTIONS*

Like flooding, ecological expertise and environmental friendly, any terrain capacity, installation time frame, all weather operations, cost effective and high performance.

## *UPRAIL CORRIDOR IS GUARANTEE HAULAGE EXPERTISE*

UPRAIL work nonstop operation any climate situation and travel any terrain like mountains, forest, rivers, etc preserving the landscape and existing ecosystem.

ADGEX provides the Whole-of-life Asset Management Solutions to our customers with a focus on Zero Harm.

UPRAIL is the power of your market opportunity!



## TECHNICAL LEADERSHIP



M.E. (Design Engineer),  
PhD in Technical Sciences

Technical President  
UPRAIL Railway Structure



M.E. (Design Engineer),  
PhD in Technical Sciences

Technical President  
UPRAIL Rolling Stock



IDSA, M.E. (Design Engineer),  
PhD in Technical Sciences

Chief Designer of UPRAIL

### Dr Ihar Dubatouka

Ihar Dubatouka has more than three decades of extensive experience in the large-scale building projects in real estate Development Corporation in European market. Dr Dubatouka is an expert in the field of Engineering structures design, Construction technologies, Construction expert examination, Complex foundations design and High-rise buildings protection.

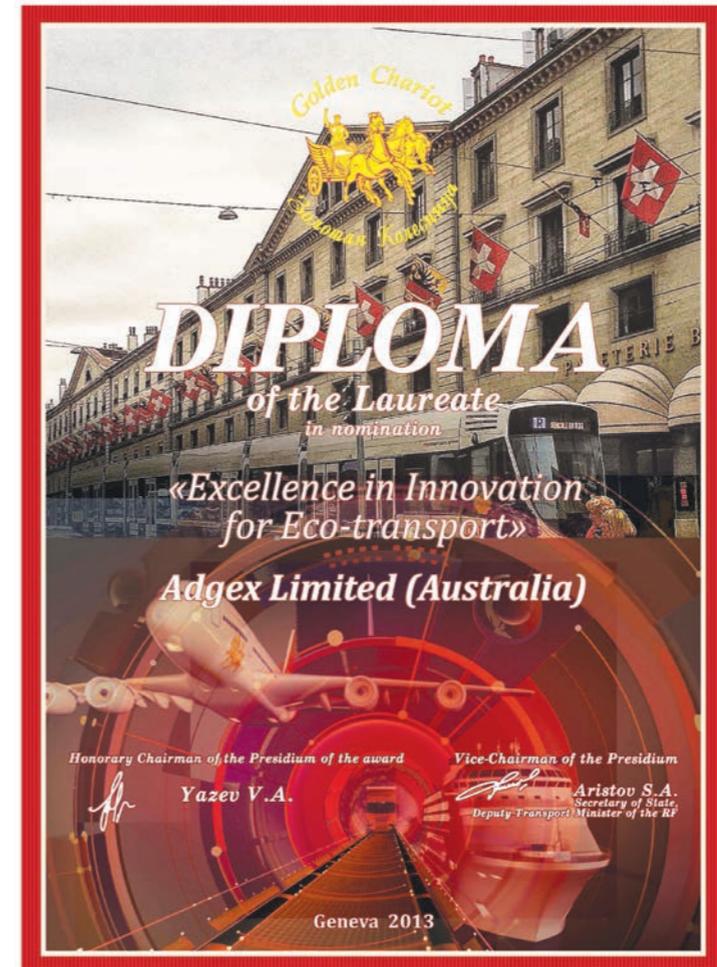
### Dr Andrey Fedorov

Andrey Fedorov has prodigious experience in design, development, manufacture of new types of industrial locomotives, and modernisation of obsolete types of railway transport. In 2005 Dr Fedorov found the Association of Mechanical Engineers and Designers, which he still leads. He has implemented numerous large scale projects relating to machinery and the locomotive industry.

### Dr Vladimir Zharkevich

Vladimir Zharkevich has held position of a Chief Designer in leading Companies since 1988. A number of design projects were developed and adopted under his leadership. Vladimir professionally knows drawing, designing, painting, modelling of objects with consideration of ergonomics. He is the author of a corporate graphic identity of Belarus Railways. He is a winner of Council of Ministers award of Republic of Belarus.

## TRANSPORT AWARD “EXCELLENCE IN INNOVATION FOR ECO-TRANSPORT”



### GOLDEN CHARIOT TRANSPORT AWARDS GENEVA 2013

28 of May 2013 in Geneva,  
Switzerland, Adgex Limited was nominated for the title of “Excellence in Innovation for Eco-transport” of the “Golden Chariot” International Transport Awards.

Adgex has received international recognition under the special international category relating to eco-friendly transportation solutions.

The Advisory Council of the Award praised Adgex Limited’s technology as a move in the positive direction for alternative solutions for high-volume commodity haulage.

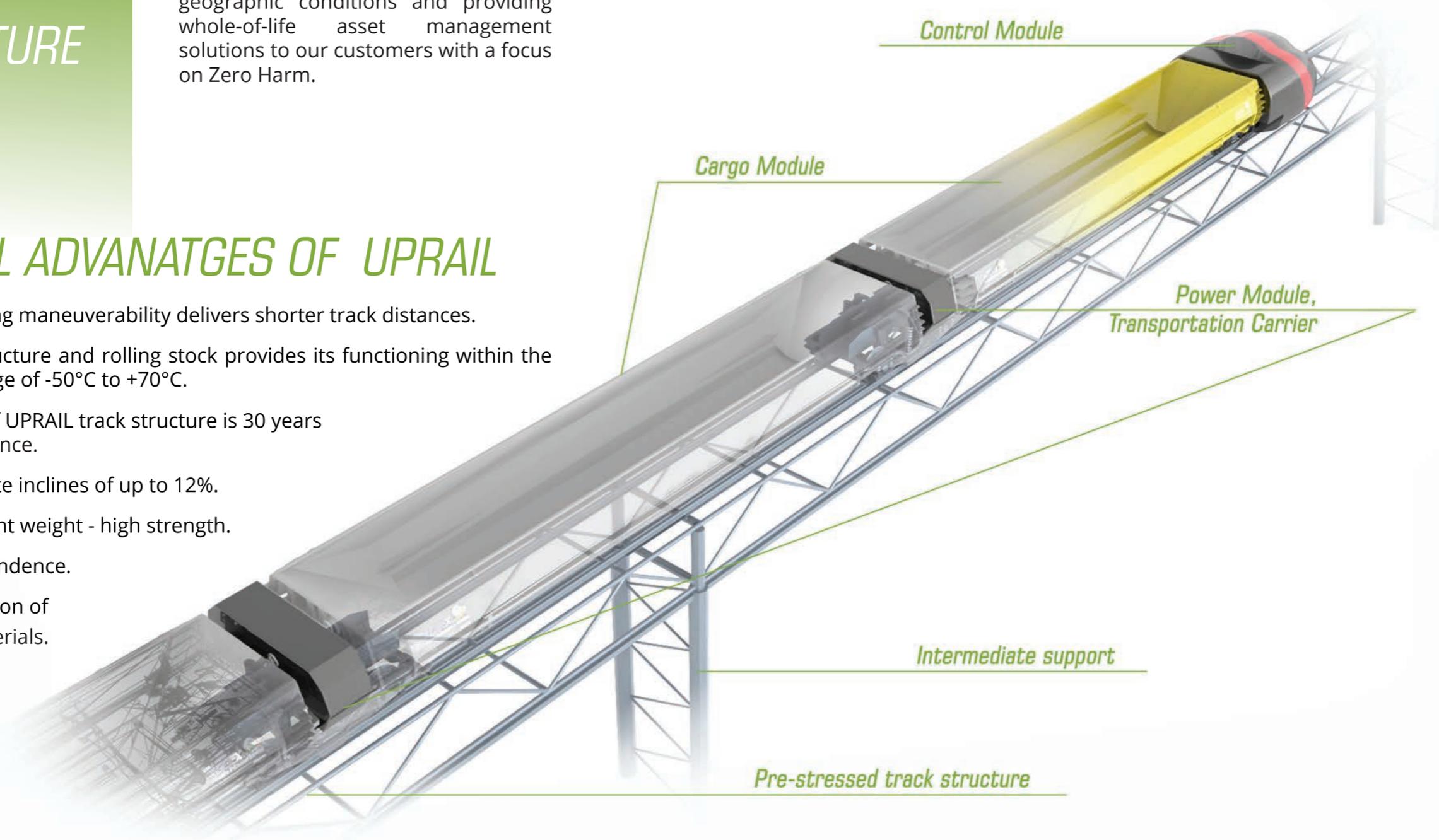
# TRANSPORT SYSTEM STRUCTURE

UPRAIL System follows the International advance standards to suit local geographic conditions and providing whole-of-life asset management solutions to our customers with a focus on Zero Harm.

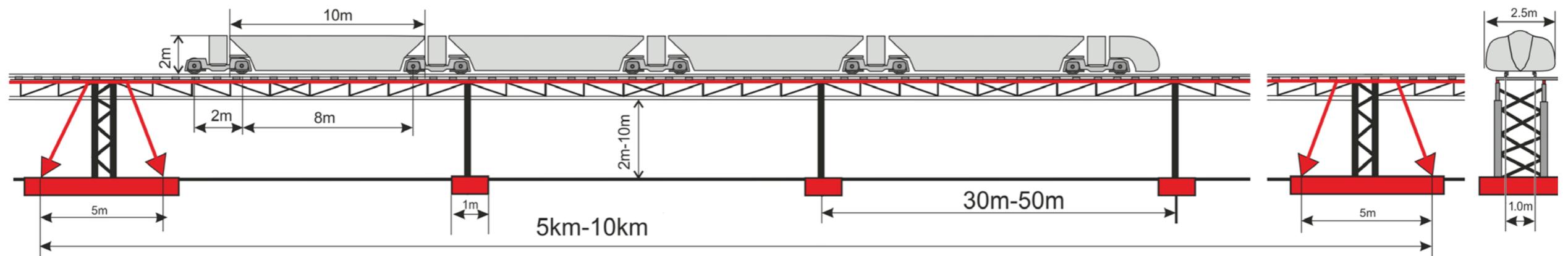
# ROLLING STOCK

## TECHNICAL ADVANATGES OF UPRAIL

- Superior cornering maneuverability delivers shorter track distances.
- UPRAIL track structure and rolling stock provides its functioning within the temperature range of -50°C to +70°C.
- The service life of UPRAIL track structure is 30 years without maintenance.
- Ability to negotiate inclines of up to 12%.
- Low footprint, light weight - high strength.
- Low terrain dependence.
- Lower consumption of construction materials.



## RAILWAY STRUCTURE



# UPRAIL SETS "NEW INDUSTRY STANDARDS"

UPRAIL System specially designed with new standards and considering today's resource-constrained environment, the pressure is on to reduce CAPEX and OPEX.

Capital investment and an asset may have strong future impact on operational efficiencies and return on investment (ROI) figures.

## CAPITAL EXPIDENTURE

- Highly lucrative haulage of 60 Mtpa over any terrain and distance.
- Direct direction of corridor with minimal land disturbance (around 100m<sup>2</sup>/km).
- The Energy efficient of UPRAIL.
- Non-stop haulage due to UPRAIL is advanced level under the ground.
- Fully automatic operation reduces inefficient labour costs.
- Most geographical location of the targeted projects with all weather conditions.
- Significantly reducing CAPEX and OPEX forms an advantage over the conventional haulage solutions.



# UPRAIL IS THE WORLD'S BEST PERFORM EVEN ECOLOGICALLY

UPRAIL is committed to managing its services and operational activities in an environmentally responsible manner to meet legal, social and moral obligations.

We seek to be proactive in developing means by which our business can grow in an environmentally sustainable manner.

## SAFETY & ENVIRONMENT

- Lowest carbon emissions.
- Minimal land disturbance (around 100 m<sup>2</sup>/km).
- All-weather operation, no down time in floods.
- All terrain operation, no grade crossings.
- Fully grade separated track structure.
- Wild world friendly, no obstruction to fauna.
- Rolling stocks operate with low noise and low vibration.



## FLOOD PROOF GUARANTEE

Many sections of present railway were built in cuttings and tunnels which are lower than the surrounding area, or in low-lying flat areas with limited drainage, making them prone to flooding.

Flood water can wash away the ballast which supports the sleepers making the line unsafe until it is re-laid.

To avoid these entire problems, our designers innovated UPRAIL System with safe and continuous operation any terrain and weather conditions.

## WATERPROOF SOLUTIONS

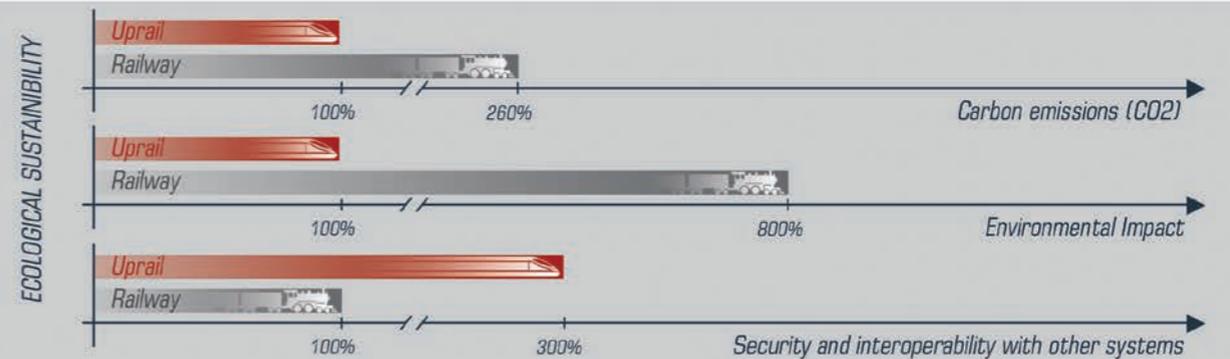
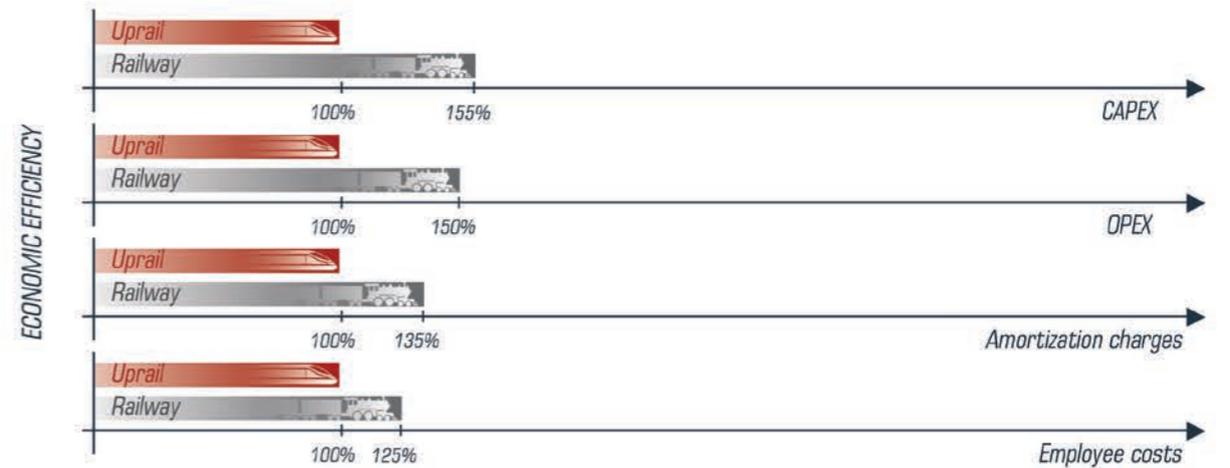
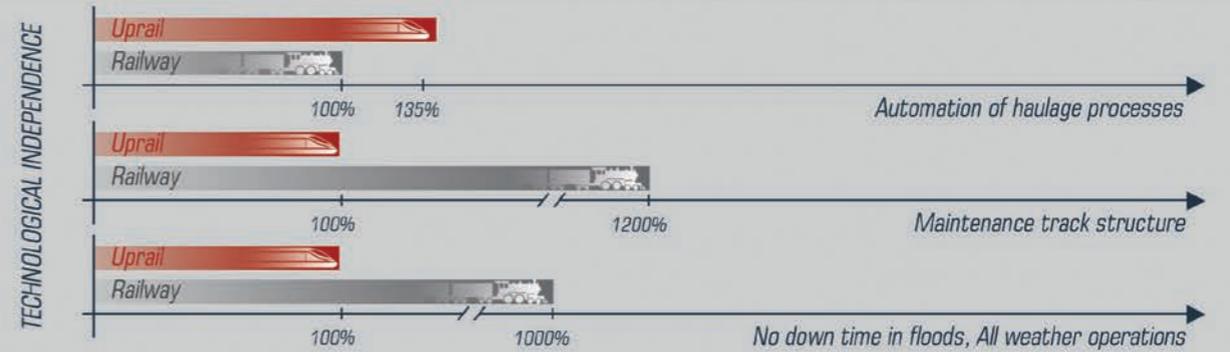
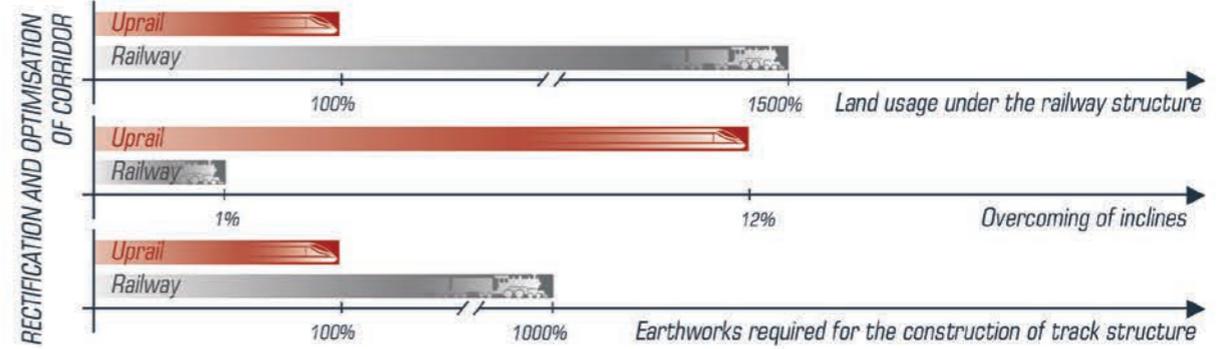
- UPRAIL system designed considering to Australian historical flood level.
- UPRAIL trains provide nonstop operation any situation.
- UPRAIL can travel any terrain, preserving the landscape and existing ecosystem.
- The advanced track structure of UPRAIL is raised above the terrain.
- The construction of an UPRAIL track structure does not require embankments, bridges and culverts.
- Dual advanced track structure with no underlying surface ensures UPRAIL resistance to such natural disasters as snowfalls and rainfalls and their consequences such as snow-wreaths, flooding.
- Opportunity to define an optimised corridor with significantly reduced length of track and total capital cost.



THE UPRAIL  
EXCELLENCE IS  
MUCH MORE  
THAN ONLY A  
SIZE



# COMPARATIVE ANALYSIS OF UPRAIL AND EXISTING HEAVY RAIL



*WHEREVER  
YOU DO, WE  
WILL BE THERE  
FOR YOU*

With a world of innovative special systems and technologies out there, it can be hard to know which solution to choose. At Adgex UPRAIL, we take the uncertainty out of the equation.

## *LOGISTICS FOR EMPLOYEES, CONTAINERS & OVERSIZE EQUIPMENTS*

Whatever your requirements, we have the knowledge and global network needed to find the best and most innovative solutions for Australia's rail and associated industries. We only endorse products that meet exacting quality standards and deliver the time and cost savings customer expectations.



*UPRAIL IS SMARTER EVERYDAY!*

## *ALL-WEATHER OPERATIONS*

From in-house investigations, through to extensive, government-accredited testing in the field, our product and technology specialists work closely with product developers to provide complete peace of mind. Australia's harsh climate demands the most rigorous due-diligence research.

***UPRAIL  
operates unpredictable  
weather situations:***

- Snowfall and blizzard
- Black ice
- Strong wind
- Shower rain and flooding
- Zero visibility



# MAKING UPRAIL YOUR SUSTAINIBLE FUTURE!

Capacity of UPRAIL is more than 50 Mtpa over the distances for more than 250km+ on the inclines of up to 12 percent.

The rolling stock consists of haulage trains with capacity up to 500 tons. Trains function on automatic modes, providing the average traffic rate 90km/h on an elevated track structure, fully customized to suit any terrain and withstand any weather conditions.

## UPRAIL – NEW ADVANCED INDUSTRIAL BENCHMARK!

### UPRAIL Cornerstone Advantages

- High performance transportation solution
- Providing whole-of-life asset management solutions our customers with a focus on Zero Harm
- All-weather & all terrain operations
- Less supporting structure and High quality
- Trouble-free Installation
- World's best perform even ecologically
- Safety and environmental sustainability
- Low Costing & Revenue Boosting



# TRIPORT

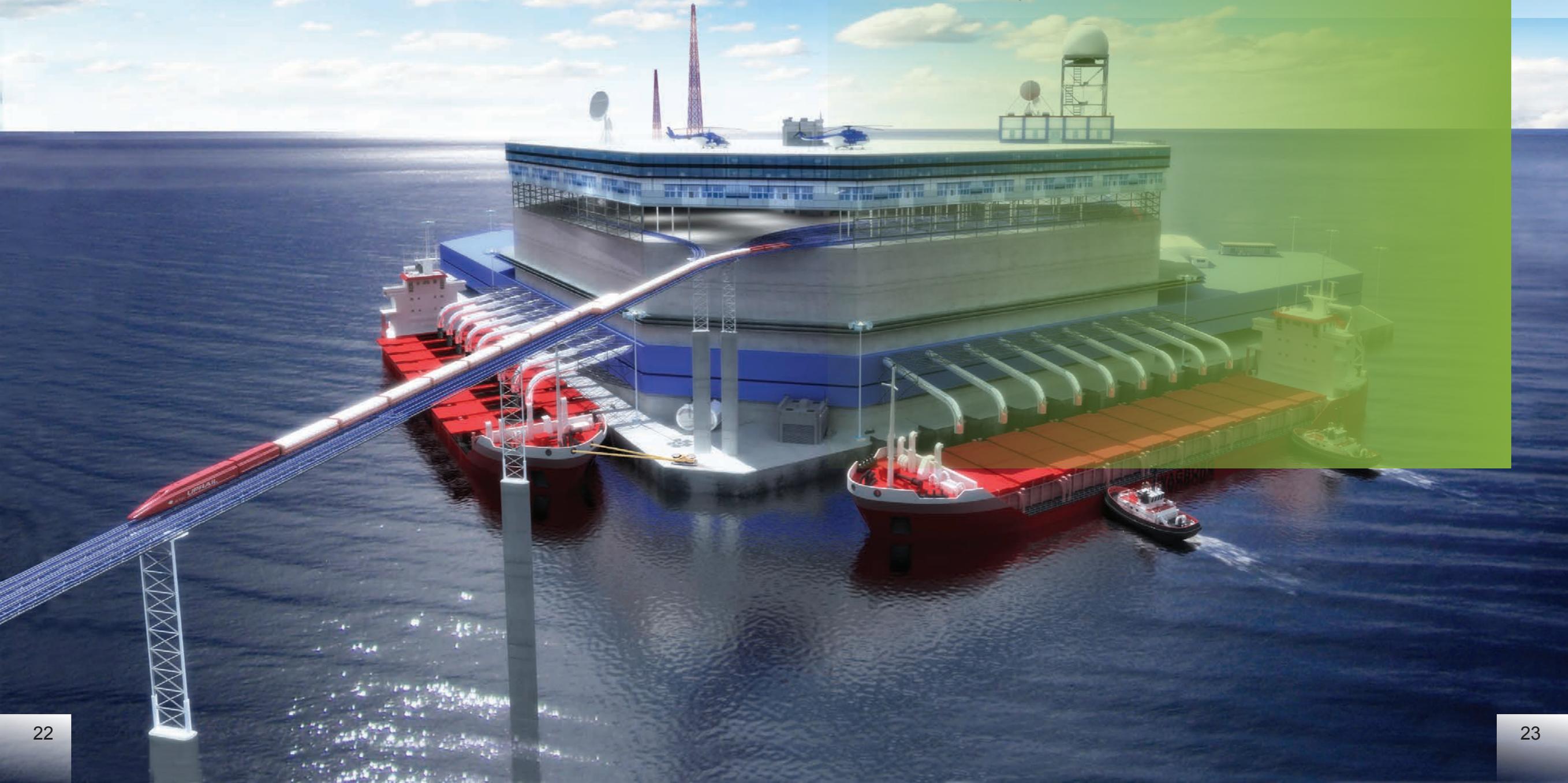
Sea ports is core node where bulk commodities are paid by consumers and loaded to their vessels. Thus, the sea port becomes the centre of logistic in modern network of transport infrastructure. However, today hundreds of bulkers over the world with time-charter rate of \$ 100,000 per day are waiting to be loaded/unloaded at ports during 7-10 days. The loss of only one bulk carrier is on average A\$1M.

Henceforth, the problem of lack of existing of deep-water ports can be solved by TRIPORT construction.

# GLOBAL PORT OPERATOR THROUGH SEAMLESS INTEGRATION WITH UPRAIL

## Highlights of Off-shore Port:

- Seamless integration with Uprail and liquidates intermediate transshipments in logistic scheme and increase effectiveness of operation.
- There are no needs in vast onshore territories for stockpiles of raw materials.
- Minimisation of CAPEX for dredging and sea port area formation because of the use of natural depth.
- Minimising approach channels and demurrage of bulkers.
- Three ship loaders provide Port capacity of up to 100 Mtpa with non-stop 24 hour operation
- Offshore location of the Port reduces the environmental impact during construction and operation.



# MODULAR CONCEPT OF LOCOMOTIVES

## NEW GENERATION OF LOCOMOTIVES

- Increased efficiency at shunting operation modes
- Locomotive structure based on unified modules
- Power plant based on modern diesel engines
- Jawless bogie with anti-friction traction motor support bearings
- Traction electric motor with axle-wise thrust adjustment
- Low Operation Expenditure
- High coefficient of locomotive readiness
- Compliance with ecological standards

More than 20-year expertise and skills of the Adgex's team permit us to deliver efficient, competitive, and sustainable rail operations.

We have developed modular concept of locomotive production, lifting us to a fundamentally new generation in locomotive construction.

We can produce and easily assemble a special-purposed locomotive, suitable for demands of each particular client.

As playing in construction kit, we can manufacture completely new or breathe a new life into an obsolete model of existing locomotive.

Interchangeable modules permit endowing locomotives with matchless technical specifications.

Various capability, types of axles, gradients, tractive, load and many other parameters can be now chosen by customer and implemented by our team with ease, taking a universal platform as a base and filling it with necessary elements.

Henceforth, there is no need to transfer broken locomotive or any part into repair depot.

By means of modern fault detection system, majority of maintenance works can be fulfilled on site.

# INDUSTRIAL & SPECIAL- PURPOSE LOCOMOTIVES

## CONCEPT OF MODULAR LOCOMOTIVES:

## FROM TECHNICAL NOTION OF DESIGNER TOWARDS

## ACTUAL EMBODIMENT OF A NEW GENERATION OF MACHINES!



# UPRAIL TESTING TRACK

A full scale test track of UPRAIL freight transport system was built in October 2001 in the town of Ozyory, Moscow Region, Russia.

## Key characteristics of UPRAIL testing ground

Simulator unladen mass	up to 10t
Simulator operating speed	up to 60km/h
Power unit capacity	150h.p.
Length of a track	150m
Span length	From 12 to 48 m
Height above the terrain	Up to 15m
Gage	2m
Diameter of bearing rails	102m
Track gradient	10%

The following units and components were tested at the full scale test track:

- various strings
- string anchorage
- relaxation of pre-stressed strings
- pile-supported, drill-injection and plate foundations of intermediate and anchor supports
- special high-strength concrete for filling string-rails
- two-rim steel wheel damped with a rubber interlayer between the rim and the nave
- wheel-rail cohesion

The researches on UPRAIL testing ground proved the technology of elevated track structure construction using highly stressed ropes (cables) with no less stiffness as compared to bridges (overpasses). The main technical solutions and UPRAIL reliability were also checked.

ADGEX IS THE WORLDS ONLY MANUFACTURE OF ELEVATED AND SUSPENDED UPRAIL SYSTEMS



**The project of testing ground and construction technology was developed by Ihar Dubatouka, PhD in Technical Sciences**



# INTELLECTUAL PROPERTY

*Adgex UPRAIL declared achievements  
in fields of IP:*

## EXCLUSIVE RIGHTS TO KNOW-HOW

- **May 2013**, ADGEX has acquired Exclusive rights to “Know How” relating to elevated track structure known as “UPRAIL”. Behind this “Know How” assets, lies some of the most advanced transport engineering, proven civil construction techniques and optimised individual structural components.
- **August 2014**, ADGEX has acquired Exclusive rights to the technology named “Concept of Modular Locomotives”. New conception of rapidly and mutually interchangeable operative modules of the main and supplementary locomotive’s equipment with common base. Modular structure represents non-stationary fast-detachable sections with hulls, where equipment of common purpose is positioned.
- **October, 2014**, ADGEX has acquired Exclusive rights to the technology named “Drive Control and Anti Derailment Mechanisms for Transport Systems”. This is a technology, consisting of four elements: differential of a brand new, reliable and durable structure, manufacturing of which does not require high-precision equipment and significant expenses.

## INTERNATIONAL PATENTS

- **May 2014**, PCT patent application “An elevated railroad and a method of providing an elevated railroad” prepared and filed by Phoenix Intellectual Property lawyers. This very important invention has based principles of the lateral and longitudinal stability of the light rail track structure.
- **August 2014**, Australian provisional patent application “A Locomotive and a Method of making a Locomotive” has been prepared and filed by Phoenix Intellectual Property lawyers. Technologically new principles of modular approach in locomotive construction enable to create high-tech locomotives with usage of fast-detachable sections with unified modules.
- **“Monorail Transportation System”**, Patent No 86918 dt on 28.08.2009. The present transportation system provides high-speed safe motion of transport module on the roadway by means of reliable contact of drive wheels with inclined basis of monorail, which does not permit transport module to lose contact with compact and light structure of road track.
- **“Undercarriage for monorail transport”**, Patent No 99407 dt on 16.08.2010 and No 111499 dt on 09.09.2011. The present undercarriage for monorail transport has increased contact reliability with monorail and feasibility to adjust contact force that facilitates improvement of motion safety for transport module on the monorail, during both horizontal motion and negotiating of inclines.

*We appreciate your attention to  
ADGEX Limited!*



<http://www.adgex.com/media.aspx>



Like us on Facebook : <http://facebook.com/AdgexLimited>



Join us on LinkedIn : <http://linkedin.com/company/adgex-limited>



See us on YouTube : <http://youtube.com/ADGEXLimited>



[WWW.UPRAIL.ADGEX.COM](http://WWW.UPRAIL.ADGEX.COM)

**WELCOME  
TO OUR  
BUSINESS!**



ADGEX LIMITED  
(ACN 156 556 035)  
SUITE 409, 3 FERNTREE PLACE,  
EPPING NSW 2121,  
SYDNEY, AUSTRALIA

TEL. +61 416 377 950  
FAX +61 2 8003 9725

[INFO@ADGEX.COM](mailto:INFO@ADGEX.COM)  
[WWW.ADGEX.COM](http://WWW.ADGEX.COM)

