

GRAIN TRANSSHIPMENT OPTIMAL CONTROL

SENUMAC

SEngineering



Production



**Software
Development**



Engineering



Consulting

S Engineering



EPC- contractor



Assembling



Outsourcing



Servicing



Commissioning

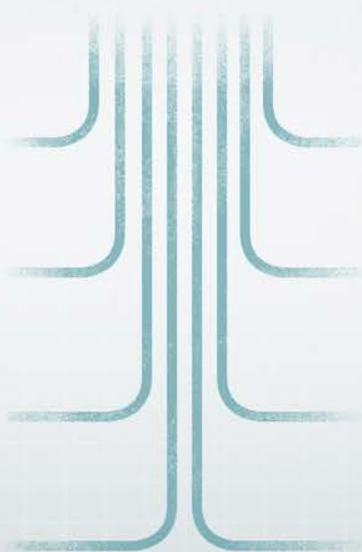
S Engineering

LICENSE HOLDER
SIEMENS AG

Status of International Partner
SIEMENS Solution Partner

Patented technologies
SENUMAC и LEFFOL

500 Projects since 2007



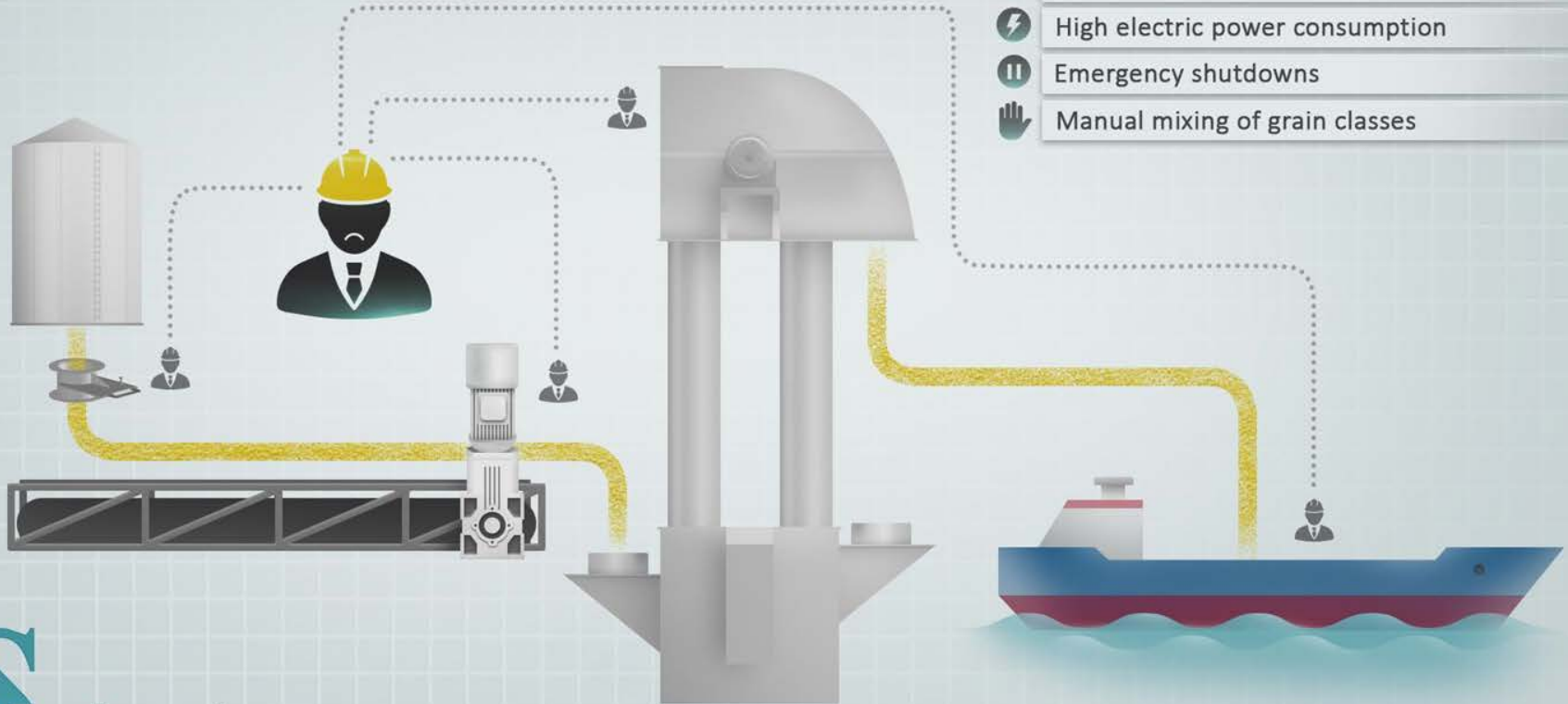
Energy Management System
ISO 50001:2011






Occupational Health and Safety
Management System
OHSAS 18001:2007

Environment Management System
ISO 14001:2015

Quality Management System
ISO 9001:2015

PROBLEMS



-  Dependence on operator's experience
-  Low efficiency
-  High electric power consumption
-  Emergency shutdowns
-  Manual mixing of grain classes




TO EXCLUDE
EMERGENCY
SHUTDOWNS

TECHNOLOGY **SENUMAC**



TO AUTOMATE
MIXING
GRAIN CLASSES



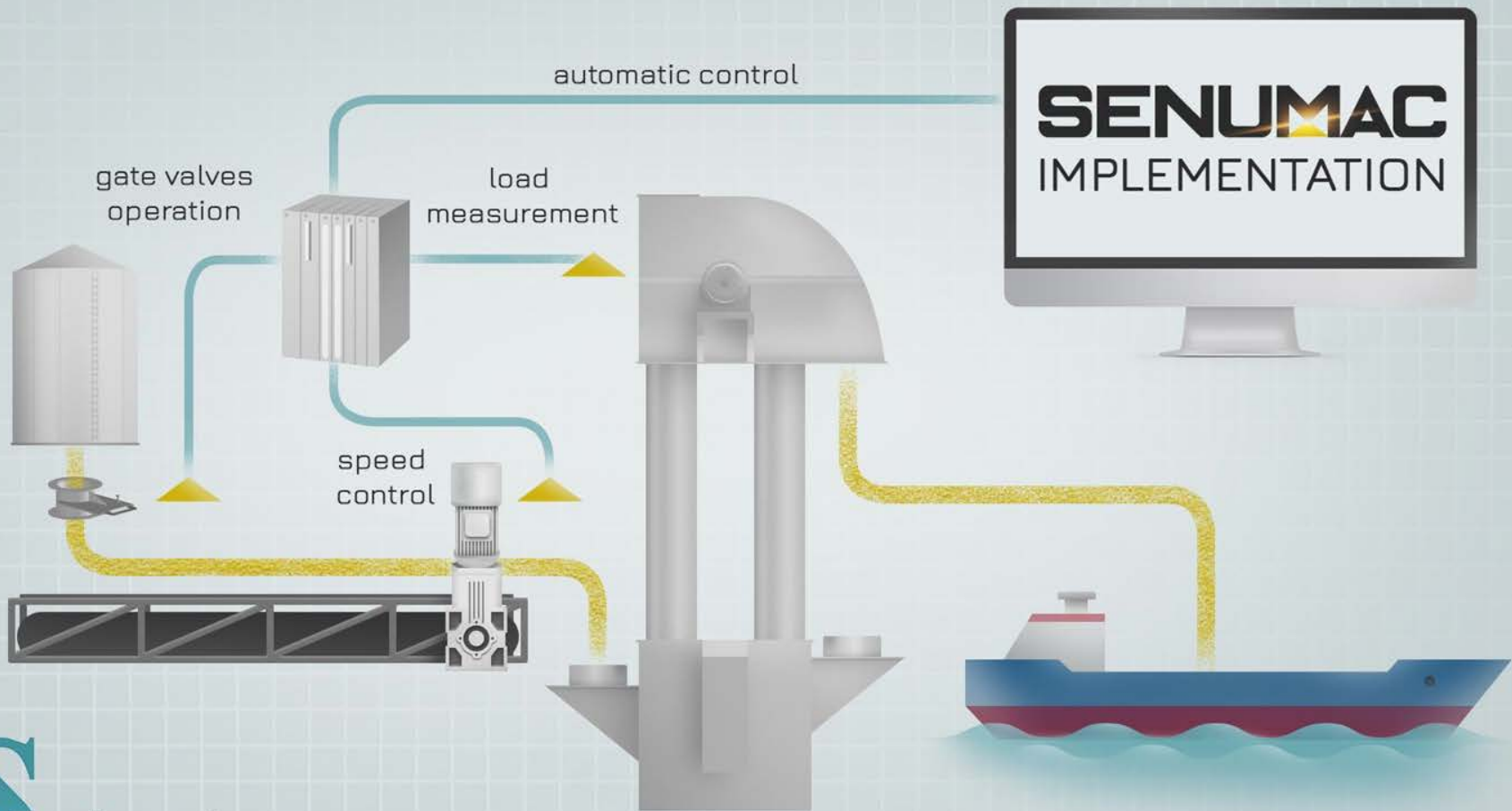
TO INCREASE
PRODUCTIVITY
UP TO **15%**



TO MINIMIZE
HUMAN FACTOR
IMPACT



TO REDUCE ELECTRIC
POWER COST



SENUMAC

FUNCTIONS

PRODUCTIVITY ASSURANCE

90-95%



65-85%



ACCURACY OF DOSAGE REGIME

90-95%



60-70%



OPERATION SPEED (minutes)

2-5



5-20



RESISTANCE TO EMERGENCY SITUATIONS

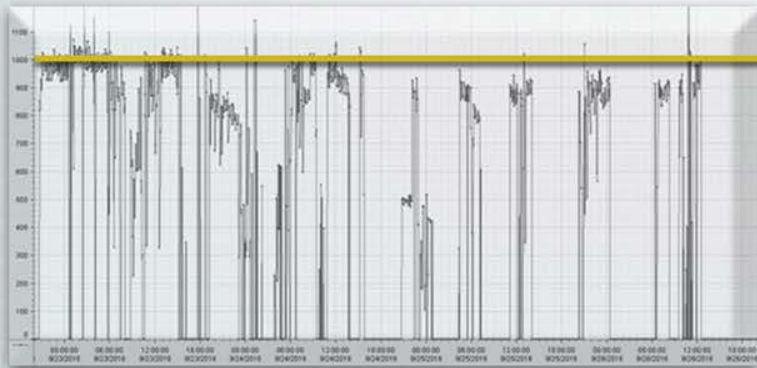


 **SENUMAC**

 **CLASSICAL ELEVATOR**

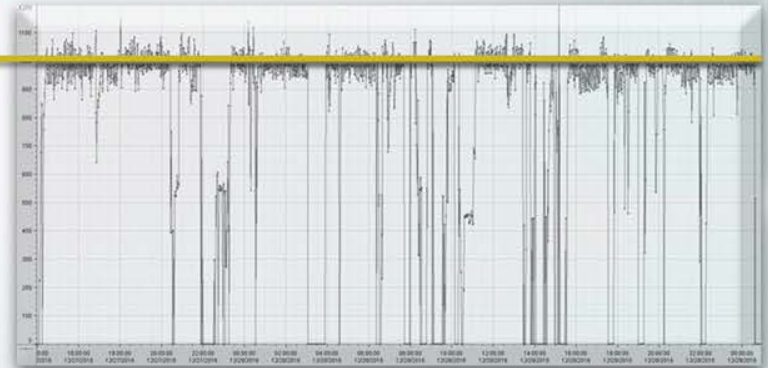
PANAMAX SHIP LOADING PERFORMANCE COMPARISON

Loading schedule **PRIOR TO**
SENUMAC implementation



1000
tonnes
per hour

Loading schedule **AFTER**
SENUMAC implementation



SENUMAC IMPLEMENTATION RESULTS



20 th. tonnes GRAIN ELEVATOR

Grain output line = 100 tonnes per hour

- ▲ Productivity by 17%
- ▲ Electric power costs by 14%
- ⊗ Chain-bucket elevator blocking
- ▲ Depreciation of equipment

Operating life - 4 years



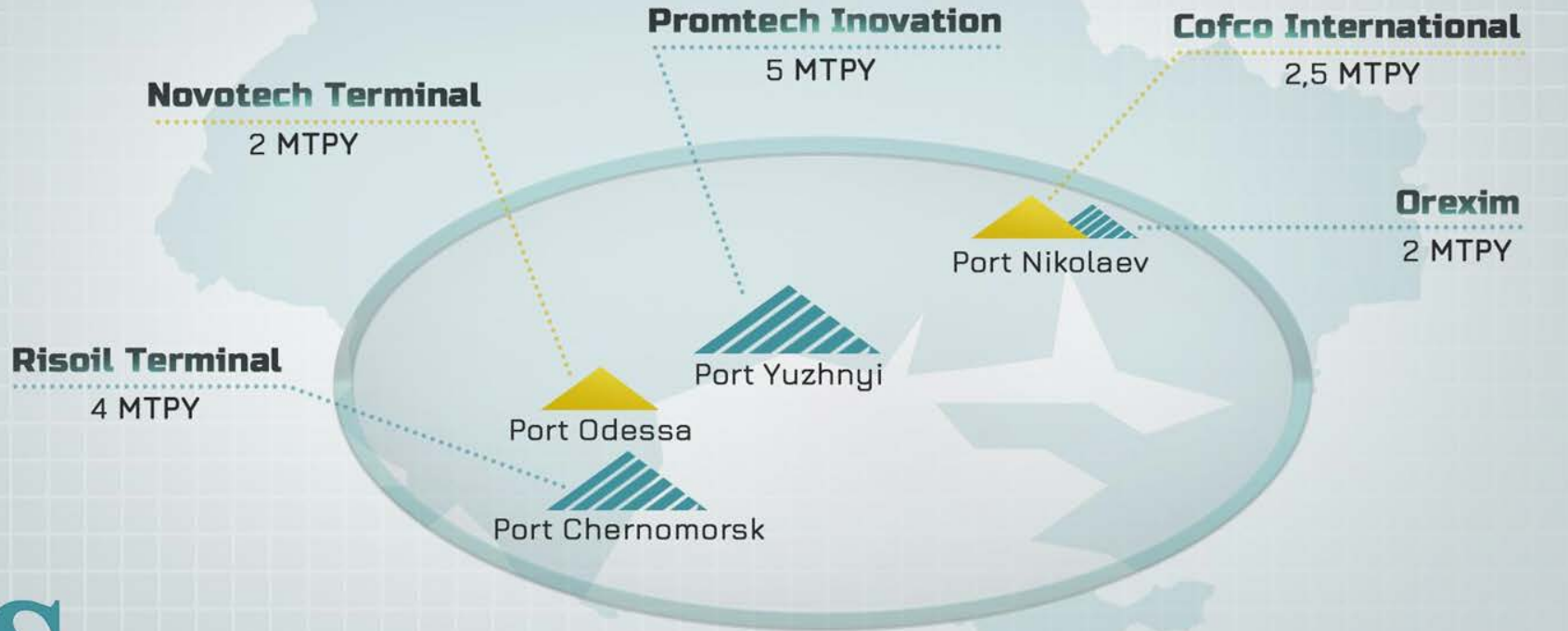
2,5 mln. tonnes PORT ELEVATOR

Loading onto ship line ≈ 1000 tonnes per hour

- ▲ Productivity by 10%
- ▲ Electric power costs by 11%
- ⊗ Chain-bucket elevator blocking
- ▲ Dosing regimen

Operating life - 18 months

GEOGRAPHIC PRESENCE



Implementation



At the stage of implementation

MTPY -

Million tonnes per year

SENUMAC SIGNIFICANCE IN MODERN PRODUCTION

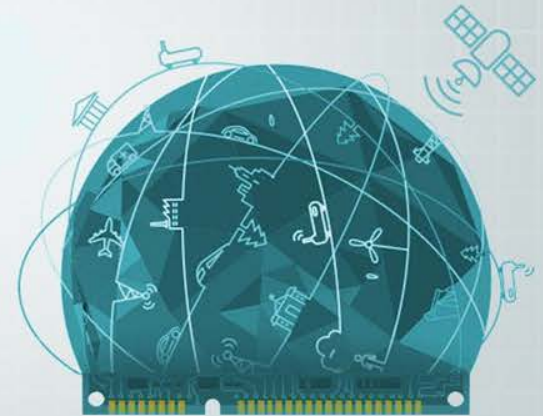
MORE EXPENSIVE RESOURCES



MINIMIZATION OF INVESTMENTS



PROGRESS OF DIGITALISATION AND AUTOMATION



SENUMAC

DISCOVER THE LIMITS