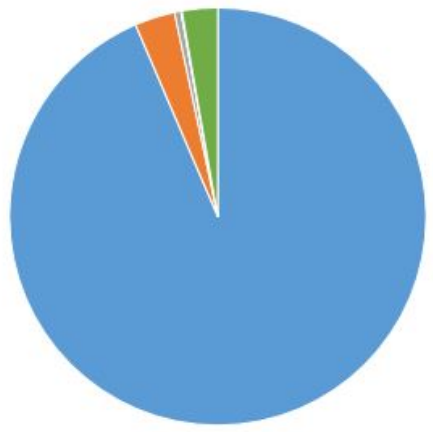


RESTORING THE CARRYING CAPACITY OF A PIPELINE DEFECTIVE SECTION USING FIBERGLASS COMPOSITE COUPLINGS



MORE THAN 10,000 ACCIDENTS ARE BEING RECORDED IN THE INDUSTRIAL OIL PIPELINES ANNUALLY!!!

Causes of Accidents in the Industrial Oil Pipelines



- Internal corrosion of the pipeline
- External corrosion of the pipeline 3.08%
- External mechanical influences
- Lack of fusion of the welded seam
- Factory defect
- Violation of operating rules

Company \years	2011	2012	2013	2014
Rosneft	7671	7338	6495	5797
Lukoil	3776	3712	3373	3114
SurgutNefteGaz	15	5	10	1
GazPromNeft	872	963	738	635
TatNeft	98	877	775	615
BashNeft	278	633	1067	1132
SlavNeft	18	20	19	10

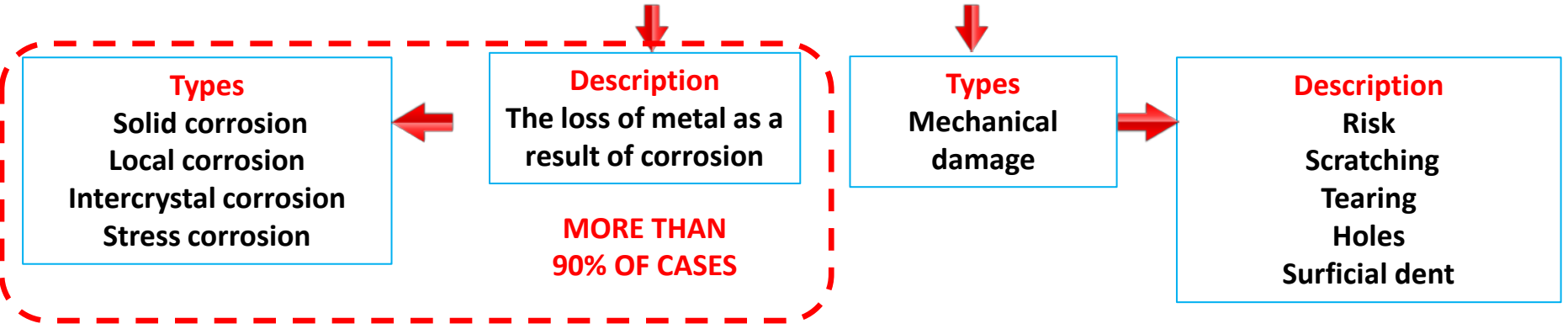


- ENVIRONMENTAL DAMAGE
- ECONOMIC DAMAGE
- INJURY AND MORTALITY

According to the Ugra Nature Protection Supervision Organ data, in the first half of 2020. 155 accidents occurred on the oil pipelines of SamotlorNefteGaz JSC (Rosneft) in the Khanty-Mansi Autonomous Region, and the total volume of hydrocarbons leaking from the broken pipes amounted has reached up to 53 tons. *

* Information taken from open sources

PIPE WALL DEFECT



PIPE GEOMETRY DEFECT

Description
Reducing of the flowing section of the pipe due to a change in its shape

Types
Dent
Corrugation
Ovality

WELD SEAM DEFECT

Description
internal and external defects in the welding seam itself or in the near-seam area

Types
Poring
Insufficient metal welding
Slag and non-metallic inclusions
Cracks
Lack of fusion

Types
Seaming defects
Burn-throughs
Craters
Influxes
Undercuts

INSET A NON-DEFECTIVE COIL, REPLACING A DEFECTIVE SECTION OF THE PIPELINE



Current/Capital Repairs



- Advantages:**
- Advantages: - 100% guarantee for the bearing capacity of the pipeline as per standard in accordance with the standards
- Disadvantages:**
- Requires "thermal" work equipment
 - Requires complete emptying of the repaired area
 - Requires heavy-duty repairs involving heavy equipment
 - High price
 - The same pipeline resistance to corrosion and chemicals

PLANT A PATCH, INSTALLATION OF CHOPS

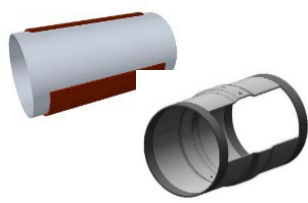


Emergency Repairs



- Advantages:- quick installation**
- Disadvantages:**
- Requires "thermal" work equipment
 - Requires emptying
 - Low resistance to corrosion and chemicals
 - Not guaranteeing the bearing capacity of the pipeline

INSTALLATION OF WELDED STEEL CLUTCH

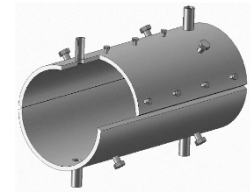


Emergency/current Repair of Non-accidental Defects



- Advantages:**
- Guaranteed bearing capacity of the pipeline
 - Installation without emptying the pipeline section
 - Installation under the pressure of the transported liquid or gas
- Disadvantages:**
- Requires "thermal" work equipment
 - Requires heavy-duty repairs involving heavy equipment
 - The same pipeline resistance to corrosion and chemicals

THE INDEX OF SEALED METAL COUPLINGS Composite Technology

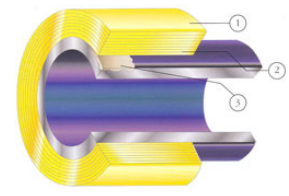


Emergency/Current Repair (not) End-to-end Defects



- Advantages:**
- Guaranteed bearing capacity of the pipeline
 - Installation without emptying the pipeline section
 - Installation under the pressure of the transported liquid or gas
- Disadvantages:**
- Requires "thermal" work equipment
 - Requires heavy-duty repairs involving heavy equipment
 - Requires additional personnel
 - high price
 - The same pipeline resistance to corrosion and chemicals

INSTALLATION OF COMPOSITE BANDAGES



Emergency/Current Repair of Non-accidental Defects



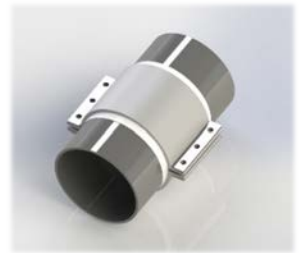
- Advantages:**
- Fast installation and no "thermal" working equipment required, as installation is carried out under the pressure of the transported liquid or gas
 - High resistance to corrosion
 - Light weight
 - Durability
- Disadvantages:-**
- relative strength- high price-
 - susceptibility to cracking and delamination

Fiberglass Repair Clamp

FOR REPAIR AND RESTORATION OF THE LOADING CAPACITY OF THE PIPELINE



In 2020, the research and development of fiberglass composite couplings production technology is carried out



Competitive advantages of fiberglass composite fittings compared to metallic couplings :



CHEMICAL AND ATMOSPHERIC RESISTANCE
retention of strength up to 30 years



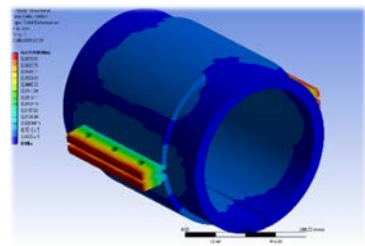
STRENGTH AND RIGIDITY
volume-reinforced fiberglass frame



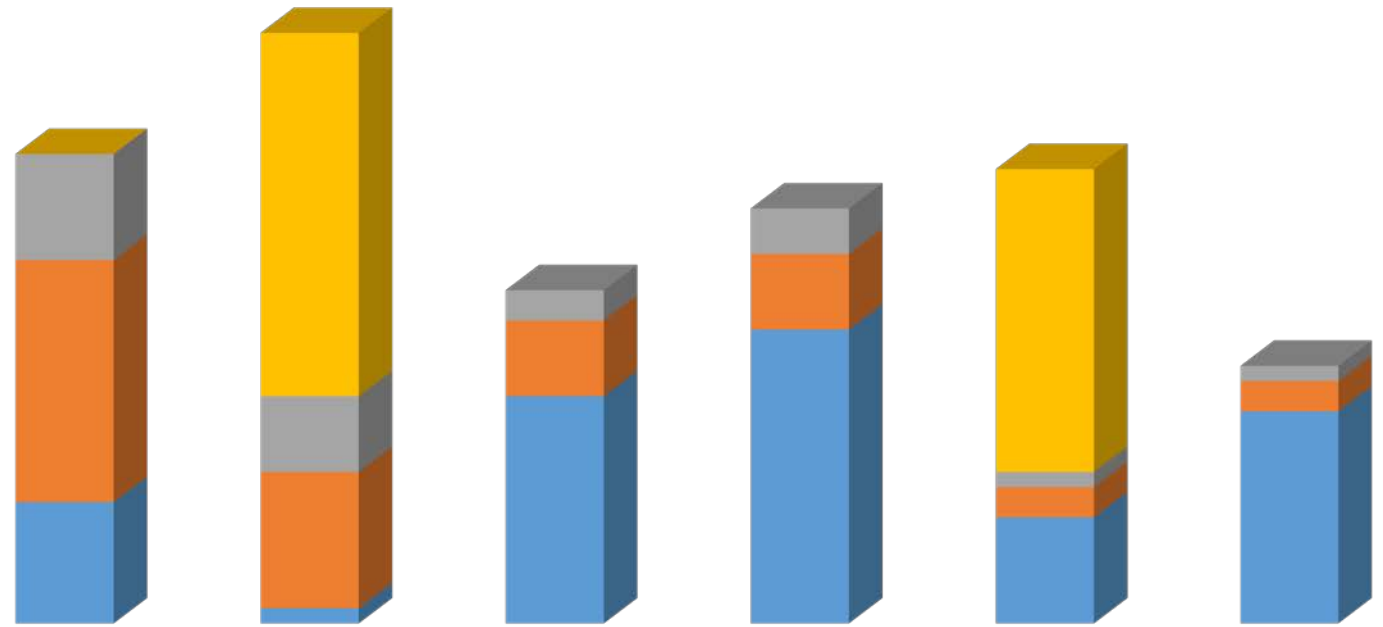
LOW WEIGHT
3 times lighter than steel



MANUFACTURABILITY, EASE OF INSTALLATION
No need for "thermal" work equipment
No heavy equipment required
Up to 2-3 specialists are required for the installation of half couplings



Economic efficiency of the pipeline repair



"Coil"

Patch

Welded steel sleeve by composite technology

Welded steel sleeve by composite technology

Composite bandage

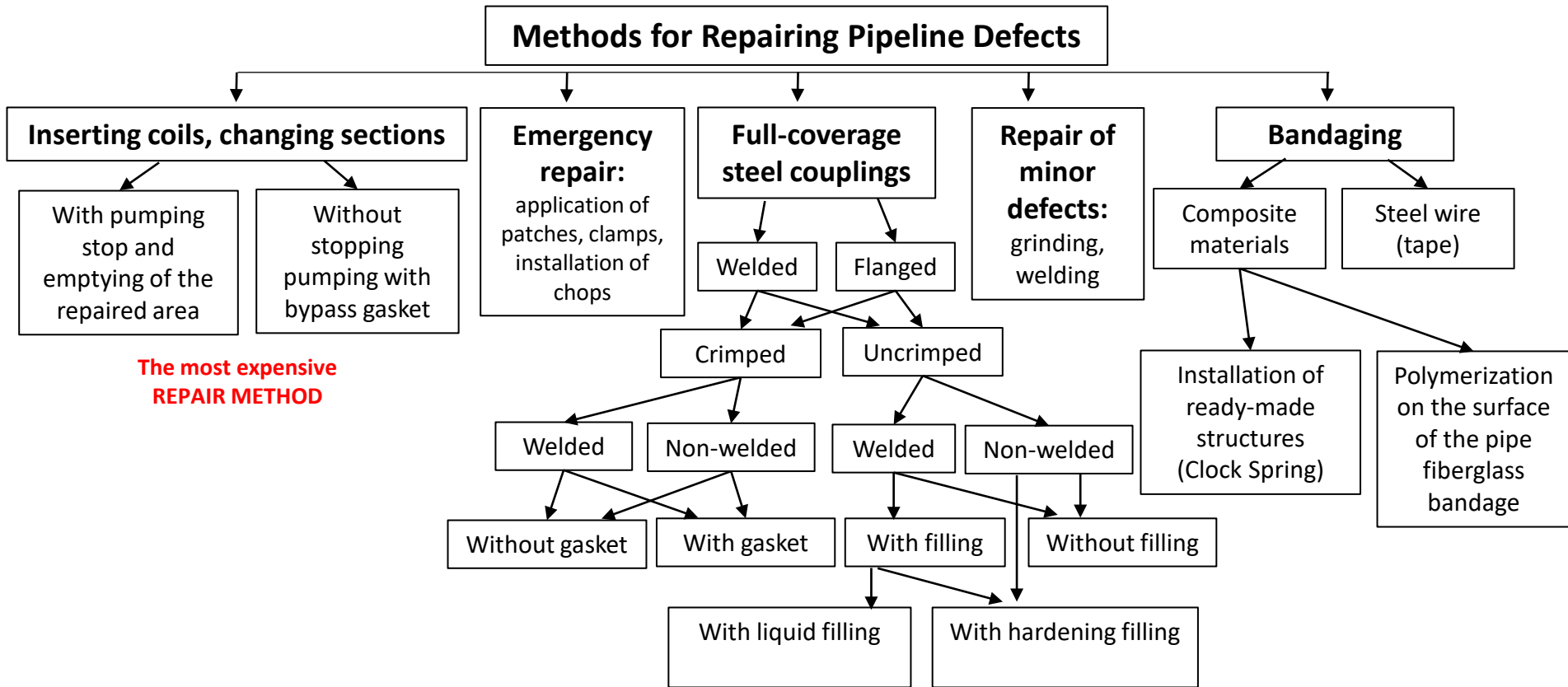
SmartService Fiberglass Composite Couplings

ECONOMIC EFFICIENCY UP TO 30%



■ Material/Product cost ■ Preparatory Work ■ Setting-up ■ Repeated works during the remaining period of operation

Methods for Repairing Pipeline Defects



The most expensive REPAIR METHOD

RD 153-39.4-067-04

Methods for repairing defective sections of existing oil main pipelines

Repair Structures

Temporary

Permanent

(up to the current repairs) (for the entire service life of the pipeline)

EXAMPLE

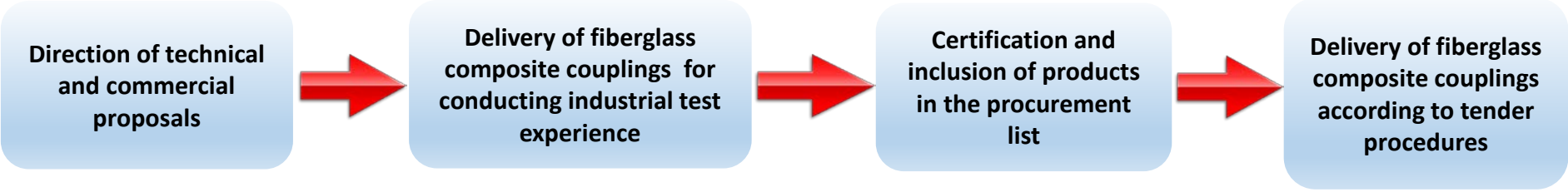


RUSSIAN MARKET (STAGE 1)



ROADMAP ON SUPPLIES OF FIBERGLASS COMPOSITE COUPLINGS TO OIL AND GAS ORGANIZATIONS AND COMPANIES OF THE RUSSIAN FEDERATION

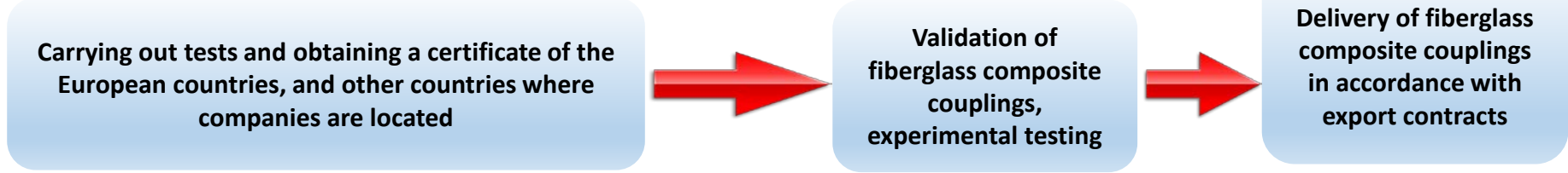
3-6 months after launching the project



INTERNATIONAL MARKET (STAGE 2)



ROADMAP ON SUPPLIES OF FIBERGLASS COMPOSITE COUPLINGS TO OIL AND GAS ORGANIZATIONS AND COMPANIES OF FOREIGN COMPANIES



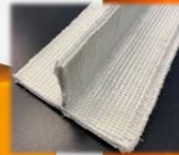
About SmartService LLC; Stages of Development

A leading research and production enterprise in Russia, specializing in the manufacture of volume-reinforced preforms using 3D weaving technology and polymer-composite products for the aerospace industry

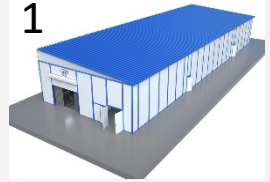
Development, construction and launch of an automated weaving complex mastering serial production

Organization and development of serial production of 3D preforms, and composite products: couplings, bolts, etc.

Modernization of a wooden weaving machine for 3D weaving



Production of experimental products for the benefit of customers



Start of work on 3D weaving

