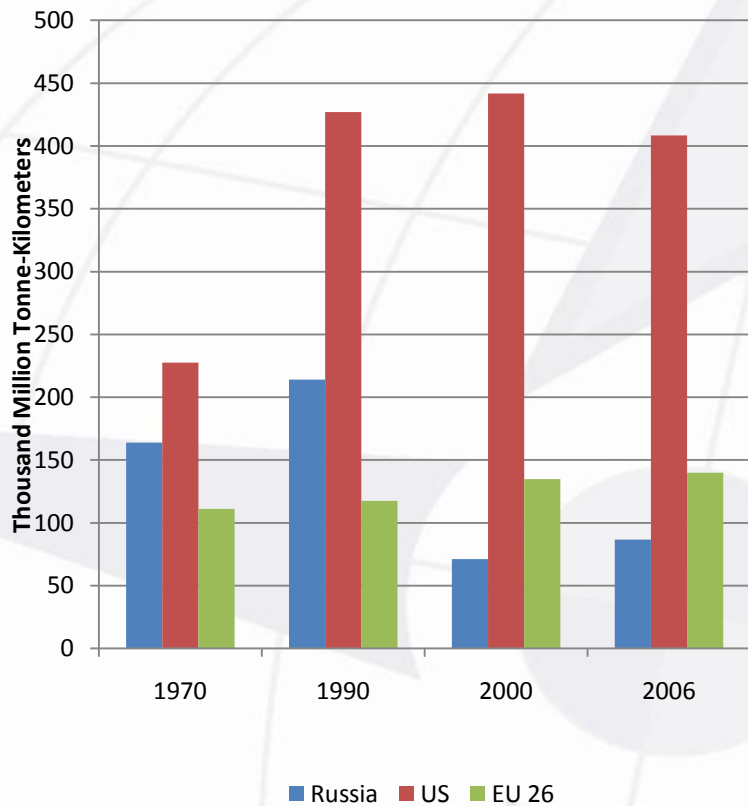


**Manual on Performance  
Indicators for Inland Waterways  
Transport  
PIANC Incom WG 32**



# Waterway Usage- Russia, Europe and U.S., 1970-2006



	Kilometers	Share
China	110,000	18%
Russia	102,000	16%
Brazil	50,000	8%
United States	41,009	7%
Indonesia	21,579	3%
Colombia	18,000	3%
Vietnam	17,702	3%
European Average	52,332	8%

# PIANC?

- World Association for Waterborne Transport Infrastructure
- USACE – National Section
- INCOM, MARCOM, RECOM, ENVICOM, YPCOM

# InCom WG 32 -Performance Indicators for Inland Waterways Transport

- September 2007
  - Official start of WG 32
- September 2007
  - Basic study of Performance Indicators
  - General introduction and fundamental theories
- September 2008
  - Intermediate Report
- January 2009
  - New structuring of the contents Elaboration of the Manual
- February 2010
  - Completion of the Final Report Manual on Performance Indicators for Inland Waterways Transport

# Terms of Reference

- Reflect the critical success factors
- Improve the overall performance of inland waterway navigation (IWN)
- Set common definitions, standards, and measurements
- Encourage industry-wide adoption
- Increase attractiveness for users
- Technical and non-technical performance criteria
- Evaluation of the elements
- Development of a list of criteria or indicators for each element to validate
- Determination of an assessment method to rank

# Objectives of WG32

- Intermodal applicability
- Comparability with other transport modes
- Performance measurement system appropriate for all kind of inland waterways
- Standardized approach (reference model)
- Internationally accepted and applied guidelines
- Standard reference document used by national administrations

# Performance Indicators shall...

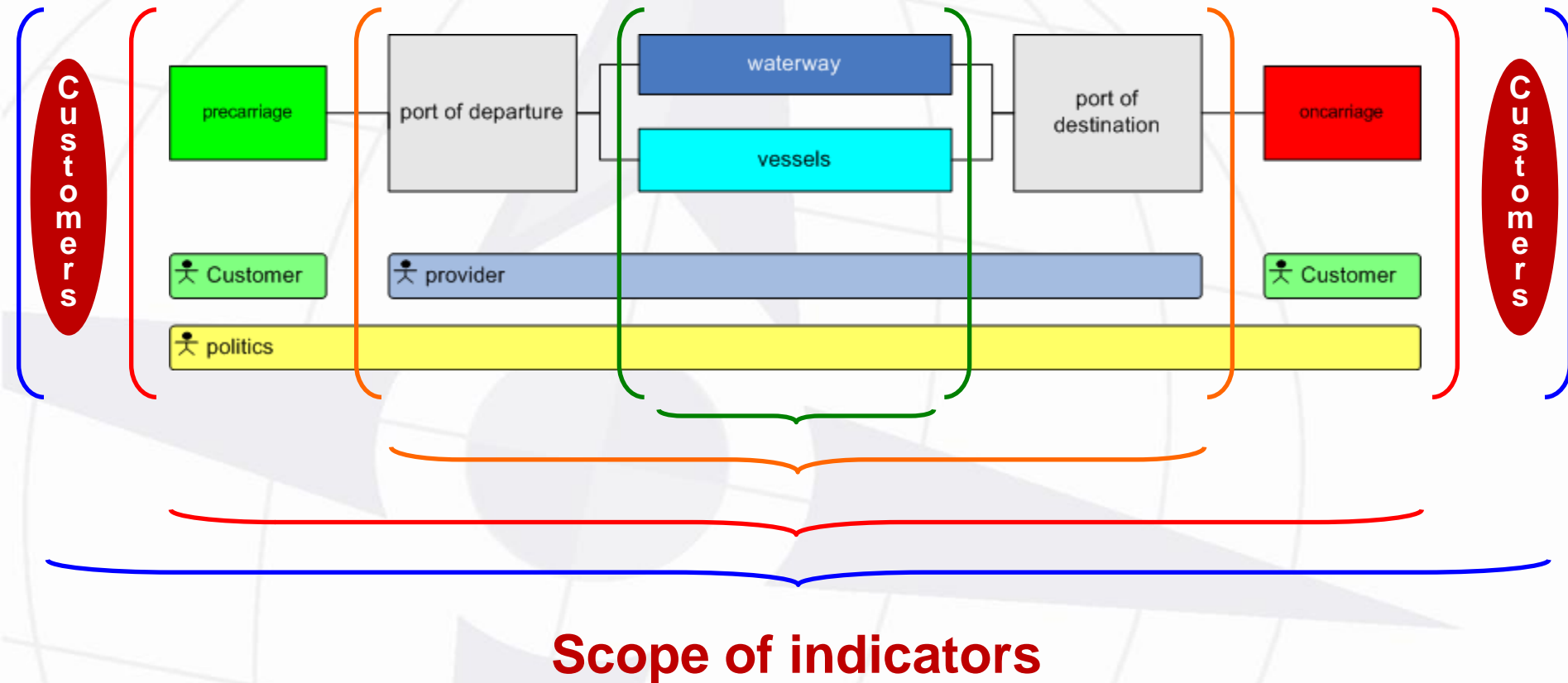
- affect strategic, tactical and operational planning and control
- play an important role in setting goals, evaluating performance and determining future course of action
- identify an organization's success
- analyze whether customer's and stakeholder's needs are met



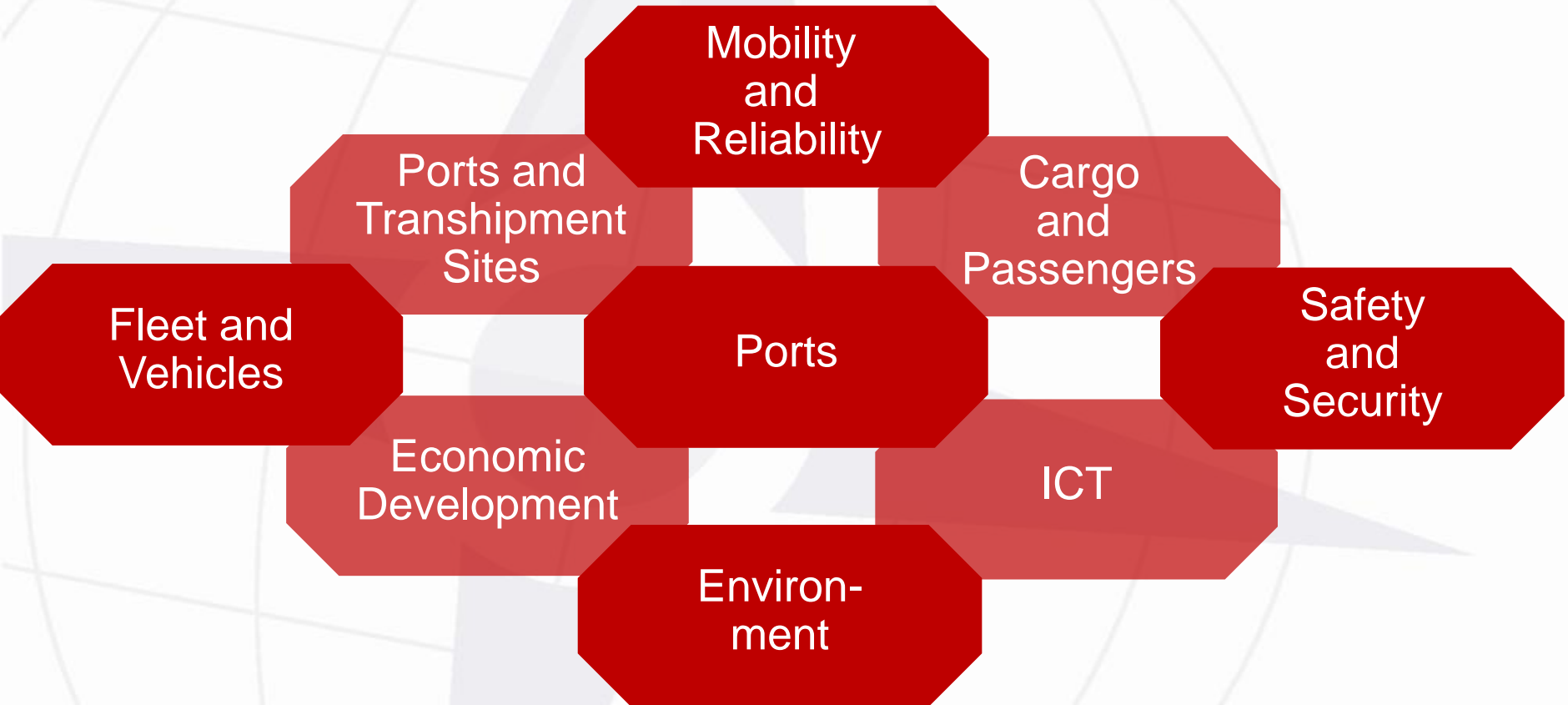
# 6 Steps to Define Performance Indicators

- **Particularise the necessary basic data**
- **Recommend a potential data source**
- **Describe the calculation method**
- **Explain the measurement unit**
- **Suggest a collection regularity**
- **Define an objective**

# Performance indicators within the supply chain



# *Areas of Application*



Area of application ID	Name of the Area of Application												
Performance indicator ID	Name of the performance indicator												
Description	Detailed description of the provided information												
Calculation	Formula that describes how to calculate the performance indicator												
Terms	Definition of terms which are used within the formulas												
Information	Additional information that is necessary for deeper understanding												
Measure	Measurement unit in words												
Collection	365												Daily
	52												Weekly
	1	2	3	4	5	6	7	8	9	10	11	12	Monthly
	1			2			3			4			Quarterly
	1						2						Semi-annually
	1												Annually
Objective	What is the objective that is followed by this performance indicator												
Comment	Further information or comment on the performance indicator												
Complexity	Indicates the level of implementation corresponding to the level of complexity of the recommended PI. It is therefore differentiated in three categories:												
	Level 1					Level 2				Level 3			
Application	Indicates the recommended application of the PI within three categories:												
	Operation					Information					Reference		

# Infrastructure

## P.1.1 AVAILABILITY OF LOCKS

P.1.1.a	Total availability for service of lock	Percent
P.1.1.a.1	Availability for service of a lock considering downtimes due to weather conditions	Percent
P.1.1.b	Total stop of lockage	Percent
P.1.1.b.1	Stop of lockage considering downtimes due to weather conditions	Percent

## P.1.2 LOCK UTILISATION

P.1.2.1	Average number of lock activations per operation hours	Lock activations
P.1.2.2	Average Utilisation of lock capacity per lockage	m <sup>2</sup> utilisation
P.1.2.3	Average waiting time in front of lock	...

## P.1.3 AVAILABILITY OF CORE WATERWAY INFRASTRUCTURE

P.1.3	Availability of core waterway	Change over time
P.1.3.1	Stop of navigation due to high water	Change over time
P.1.3.2	Stop of navigation due to icing	Change over time
P.1.3.3	Stop of navigation due to accidents	Change over time
P.1.3.4	Navigable days below waterway design value	Percent

## P.1.4 CAPACITY OF WATERWAY SECTION

P.1.4.1	Capacity of waterway section	...
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## P.1.5 DREDGING | MAINTENANCE OF WATERWAY

P.1.5.1	Total costs of maintenance per network kilometre	Currency
P.1.5.2	Total costs of maintenance per network ton-kilometre	Currency
P.1.5.3	Volume of polluted dredged material	Cubic Metres

# Ports

## **P.2.1 HANDLING CAPACITY**

P.2.1.1	Actual handling capacity of handling capacity	Tons   TEU
P.2.1.2	Handling capacity per quay metre	Tons   TEU
P.2.1.3	Handling capacity per truck disposal lot	Tons   TEU
P.2.1.4	Handling capacity per metre rail transshipment track	Tons   TEU

## **P.2.2 UTILISATION OF STORAGE CAPACITY**

P.2.2	Utilisation of storage capacity	Percent
-------	---------------------------------	---------

## **P.2.3 WAITING TIME FOR SERVICE**

P.2.3	Waiting time for service	Percent
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## **P.2.4 UTILISATION OF HANDLING CAPACITY**

P.2.4	Utilisation of handling capacity	Percent
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# Environment

## **P.3.1 FUEL CONSUMPTION**

P.3.1.1	Vessel Fuel Consumption	Kilogramme
P.3.1.2	Fleet Fuel Consumption	Kilogramme

## **P.3.2 EMISSION AIR**

P.3.2.1	Consumption per Ton-Kilometre	Kilogramme
P.3.2.2	Litre to Kilogramme	Kilogramme
P.3.2.3	Co2 Emission	Kilogramme

## **P.3.3 EMISSION NOISE**

P.3.3.1	Tbd...	Decibel
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## **P.3.4 WATER QUALITY**

P.3.4.1	Cargo bilge water	Ratio
P.3.4.2	Passenger bilge water	Ratio

## **P.3.5 LAND USE**

P.3.5.1	Dimension of artificial canals	Percent
P.3.5.2	Dimension of ports	Percent
P.3.5.3	Dimension of port areas	Percent

# Fleet and Vehicles

## **P.4.1 MAINTENANCE, SERVICE, OPERAING SUPPLIES**

P.4.1.1	Maintenance Costs	National Currency
P.4.1.2	Service Costs	National Currency
P.4.1.3	Operating Supplies Costs	National Currency
P.4.1.4	Total Costs of a fleet	National Currency

## **P.4.2 CAPACITY**

P.4.2.1	Fleet capacity	Tons   TEU
P.4.2.2	Capacity utilisation of a fleet	Percent

# Cargo and Passengers

## **P.5.1 CARGO TRANSPORT**

P.5.1.1	Development of total cargo transport volume	Ton-km
P.5.1.2	Development of total cargo transport performance	Tons
P.5.1.3	Deadhead share	Percent

## **P.5.2 PASSENGER TRAFFIC**

P.5.2.1	Development of total number of passenger transport along waterway section	Change over time
P.5.2.2	Development of total number of passenger transport along waterway section	Change over time
P.5.2.3	Development of total number of vessel landings at specific node	Change over time
P.5.2.4	Development of total passenger transport performance	Change over time
P.5.2.5	Deadhead share	Percent

## **P.5.3 PERCEIVED QUALITY**

P.5.3.1	Perceived quality of service	Percent
P.5.3.2	Share of certain quality deviation	Percent

# Information and Communication

<b>P.6.1 RIS COVERAGE</b>		
P.6.1.1	Availability of Inland ECDIS	Percent
P.6.1.2	Availability of AIS/tracking and tracing	Percent
P.6.1.3	Availability of Electronic Fairway Information	YES   NO
P.6.1.4	Availability of Inland Electronic Reporting	YES   NO
<b>P.6.2 ACTUALITY OF ELECTRONIC FAIRWAY CHARTS</b>		
P.6.2.1	Liability to pay costs for ECDIS updates	YES   NO
P.6.2.2	Update cycle of electronic fairway charts	YES   NO
P.6.2.3	Update Frequency	Weeks
<b>P.6.3 ACCURACY OF ELECTRONIC FAIRWAY CHARTS</b>		
P.6.3.1	Accuracy of topographic chart contents	Category
P.6.3.2	Accuracy of given water levels for navigation	Category
P.6.3.3	Accuracy of displayed buoy	Category
P.6.3.4	Accuracy of displayed traffic signs	Category
<b>P.6.4 AVAILABILITY OF ELECTRONIC FAIRWAY INFORMATION</b>		
P.6.4.1	Water Level information	YES   NO
P.6.4.2	Water level forecast information	YES   NO
P.6.4.3	Maintenance work information	YES   NO
P.6.4.4	Stop of navigation due to planned events	YES   NO
<b>P.6.4 AVAILABILITY OF ELECTRONIC FAIRWAY INFORMATION</b>		
P.6.4.5	Availability of Infrastructure due to planned events	YES   NO
P.6.4.6	Stop of navigation due to icing	YES   NO
<b>P.6.5 ACTUALITY OF AIS/TRACKING AND TRACING</b>		
P.6.5.1	Accuracy of tracking and tracing information	Category
P.6.5.2	Actuality of tracking and tracing information	Category
P.6.5.3	Availability of tracking and tracing information	Category
<b>P.6.6 AVAILABILITY OF ELECTRONIC REPORTING</b>		
P.6.6.1	Availability of electronic reporting	YES   NO
<b>P.6.7 AVAILABILITY OF PORT INFORMATION SYSTEMS</b>		
<b>P.6.8 AVAILABILITY OF ELECTRONIC FREIGHT EXCHANGE</b>		

# Economic Development

## **P.7.1 JOBS**

P.7.1.1	Development of direct generated jobs (cargo)	Change over time
P.7.1.2	Development of indirect generated jobs (cargo)	Change over time
P.7.1.3	Development of direct generated jobs (passenger)	Change over time
P.7.1.4	Development of indirect generated jobs (passenger)	Change over time

## **P.7.2 ECONOMIC DEVELOPMENT AND TRANSPORT DEVELOPMENT**

P.7.2.1	Development of cargo transport volume on IW	Ratio
P.7.2.2	Development of passenger transport volume on IW	Ratio
P.7.2.3	Development of total cargo transport volume	Ratio
P.7.2.4	Development of total passenger transport volume	Ratio

## **P.7.3 ECONOMIC IMPACT OF PASSENGER AND CARGO TRANSPORT**

P.7.3.1	Share turnover passenger transport of annual GDP	Percent
P.7.3.2	Share turnover cargo transport of annual GDP	Percent
P.7.3.3	Public revenue by inland navigation	National Currency

## **P.7.4 REGIONAL AND LOCAL DEVELOPMENT**

P.7.4.1	Share of GDP total turnover port area	Percent
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# Safety

## **P.8.1 INJURIES, FATALITIES, MATERIAL DAMAGES**

P.8.1.1	Injuries per ton-kilometre	Injuries
P.8.1.2	Fatalities per ton-kilometre	Fatalities
P.8.1.3	Damages per ton-kilometre	Damages

## **P.8.2 ACCIDENTS**

P.8.2.1	Accidents per ton-kilometre	Accidents
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## **P.8.3 ECONOMIC IMPACT OF ACCIDENTS**

P.8.3.1	Economic impact of accidents (cargo)	Ratio
P.8.3.2	Economic Impact of accidents (passengers)	Ratio

# Security

## **P.9.1 THEFT**

P.9.1.1	Thefts	Ratio
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## **P.9.2 ACCESS TO INLAND WATERWAY SYSTEM**

P.9.2.1	Infrastructure access control	Percent
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P.9.2.2	Vehicle access control	Percent
---------	------------------------	---------

P.9.2.3	Persons access control	Percent
---------	------------------------	---------

P.9.2.4	Safety fence	Percent
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P.9.2.5	Frequency of security installation maintenance	YES/NO
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P.9.2.6	Standard procedure for checking goods inwards	YES/NO
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P.9.2.7	Frequency of security trainings for staff	YES/NO
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P.9.2.8	Data backup	YES/NO
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P.9.2.9	Emergency plans	YES/NO
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P.9.2.10	Facility security officer	Percent
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P.9.2.11	Documentation of processes and certification (ISO)	Percent
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# PIANC USA

- Report will be released later this year
- PIANC USA 2010 Annual Meeting
  - September 22, 2010
  - Boston, MA
- SmartRivers
  - September 13-16, 2011
  - New Orleans, USA,