INTERNATIONAL SAVA RIVER BASIN COMMISSION

Conscious of the importance of the Sava river for the economic, social and cultural development of the region,

Desirous of development of the inland navigation on the Sava river,

Having regard to the European Agreement on Main Inland Waterways of International Importance (AGN), and in particular annex III thereof,

Believing that public authorities can contribute significantly to the development of the waterway of the Sava river through their engagement to the provision and maintenance of an appropriate waterway based on internationally agreed classifications and parameters,

In accordance with Article 16 Paragraph 1 (a) and 2 of the Framework Agreement of the Sava River Basin, Article 2 and 9 of the Protocol on the Navigation Regime to the Framework Agreement of the Sava River Basin, the International Sava River Basin Commission has adopted the following

DECISION - 26/06

on adoption of

Detailed Parameters for Waterway Classification on the Sava River

1. Text of the Detailed Parameters for Waterway Classification on the Sava River is attached to this decision as its integral part.
2. This Decision shall apply as of June 30, 2007.
3. Parties shall adopt the measures necessary to implement this Decision and notify the Commission.
4. This Decision shall be binding for the Parties unless any of the Sava Commission members withdraws his vote within 30 days after the decision has been adopted, or informs the Sava Commission that the Decision is subject to the approval of the relevant authority of his State.

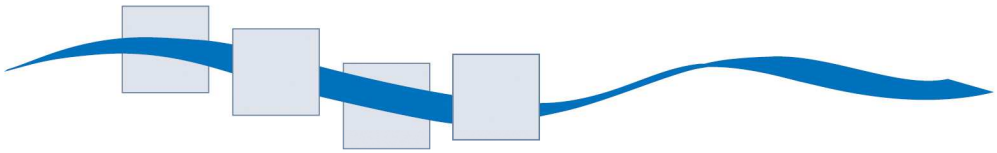
5. If no member withdraws his vote nor informs the Sava Commission that the Decision is subject to the approval of the relevant authority of his State, the Decision shall enter into force on December 15, 2006.

6. Upon entry into force, this Decision shall be binding in its entirety and directly applicable in the Parties.

7. The Secretariat shall notify the Parties of the entry into force of the Decision.

Ref. No: 1R-2-D-06-20/1-3
Zagreb, November 15, 2006

Kemal Karkin
Chairman of the Sava Commission



Conscious of the importance of the Sava River for the economic, social and cultural development of the region,

Desirous of development of the inland navigation on the Sava River,

Having regard to the European Agreement on Main Inland Waterways of International Importance (AGN), and in particular Annex III thereof,

Believing that public authorities can contribute significantly to the development of the waterway of the Sava river through their engagement to the provision and maintenance of an appropriate waterway based on internationally agreed classifications and parameters,

In accordance with Article 16 Paragraph 1 (a) and 2 of the Framework Agreement of the Sava River Basin and Article 9 Paragraph 2 of the Protocol on the Navigation Regime to the Framework Agreement of the Sava River Basin, the International Sava River Basin Commission (hereinafter: Sava Commission) on its XII Special Session held on May 6-7, 2009, has adopted the following

DECISION – 13/09

on adoption of

AMENDMENTS TO THE DECISION 26/06 ON ADOPTION OF THE DETAILED PARAMETERS FOR WATERWAY CLASSIFICATION ON THE SAVA RIVER

1. Text of the Amendments to the Decision 26/06 on adoption of the Detailed Parameters for Waterway Classification on the Sava River and Consolidated text of the Detailed Parameters for Waterway Classification on the Sava River are attached to this Decision as its integral parts.
2. Parties shall adopt the measures necessary to implement this Decision and notify the Sava Commission.
3. This Decision shall be binding for the Parties unless any of the Sava Commission members withdraws his vote within 30 days after the decision has been adopted, or informs the Sava Commission that the Decision is subject to the approval of the relevant authority of his State.

If any of the Sava Commission members withdraws his vote within 30 days after the decision has been adopted, or informs the Sava Commission that the Decision is subject to the approval of the relevant authority of his State, the Sava Commission Secretariat shall, thereof, inform all other Sava Commission members.

4. If no member withdraws his vote nor informs the Sava Commission that the Decision is subject to the approval of the relevant authority of his State, the Decision shall enter into force on June 6, 2009.

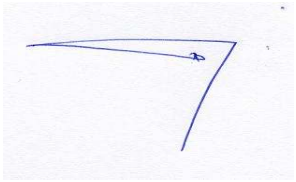
5. Upon entry into force, this Decision shall be binding in its entirety and directly applicable in the Parties.

6. The Sava Commission Secretariat shall notify the Parties of the entry into force of the Decision.

Ref. No: 1S-12-D-09-2/1-3

Zagreb, May 7, 2009

Mr. Branko Bačić
Chairman of the Sava Commission



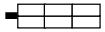
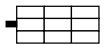
DETAILED PARAMETERS FOR WATERWAY CLASSIFICATION ON THE SAVA RIVER

Consolidated text (Decision 13/09)

DETAILED PARAMETERS FOR INLAND WATERWAY CLASSIFICATION - "SAVA INITIATIVE"'
according to (UN/ECE, GENEVA 1996.)

WATERWAY	IMPORTANCE		REGIONAL			INTERNATIONAL							
	CLASS		I	II	III	IV	Va	Vb	VIa	VIb	VIc		VII
	CLASS MARK												
MOTOR VESSELS AND BARGES	SKETCH	t & s											
		p											
	l (m)	t & s	41	57	67 - 70	80-85	95-110	95-110	95-110	120-140	120-140		120-150
		p				70	76.5-85	76.5-85	76.5-85	76.5-85	76.5-85		76.5-85
	b (m)	t & s	4.7-5.05	8.2 - 9.0 - 10.1	8.2 - 9.0 - 10.1	9,5	11,4	11,4	11,4	13-15	13-15		15
		p				9,5	11,4	11,4	11,4	11,4	11-11.4		11-11.4
	t (m)	t & s	1,4	1.6 - 2.0	1.6 - 2.0	2,5	2.5-2.8	2.5-2.8	2.5-2.8	2.8-3.9	2.80-3.90		3.90 - 4.5
		p				2.5 - 2.8	2.5-4.5	2.5-4.5	2.5-4.5	2.5-4.5	2.50-4.50		2.50-4.50
	W (t)	t & s	180	500 - 630	470 -700	1 000 - 1 500	1 500-3 000	1 500-3 000	1 500-3 000	3 000-6 000	3 000-6 000		3 000-6 000
		p					1 600-3 000	1 600-3 000	1 600-3 000	1 600-3 000	1 600-3 000		1 600-3 000
PUSHED CONVOYS	CONVOYS					**P.1**	**P.1**	**P.1.2**	**P.2.1**	**P.2.2**	**P.3.2**	**P.2.3**	**P.3.3**
	l (m)				118 - 132	85	95 - 110	172 - 185	95 - 110	185 - 195	195	270 - 280	285
	b (m)				8.2 - 9.0	9,5	11,4	11,4	22,8	22,8	33	22,8	33-34.2
	t (m)				1.6 - 2.0	2.5 - 2.8	2.5 - 4.5	2.5 - 4.5	2.5 - 4.5	2.5 - 4.5	2.5 - 4.5		2.5 - 4.5
	W (t)				1000 - 1200	1250 - 1450	1600 - 3000	3200 - 6000	1600 - 3000	6400 - 12000	9600 - 18000		14500 - 27000
MAIN CLASS PARAMETERS			Regulated rivers	Regulated rivers	Canalized rivers	Regulated rivers	Canalized rivers	Regulated rivers	Canalized rivers	Canals	Regulated rivers	Canalized rivers	Canals	Regulated rivers	Canalized rivers	Canals	Regulated rivers	Canalized rivers	Regulated rivers	Canalized rivers	Regulated rivers	Canalized rivers	Regulated rivers	Canalized rivers
	R_{min} (m)		250	250	250 - 450	300	300 - 550	360	360	700	360	360	750	450	450	800	450	450	600	600	750	1000	1000	1200
	T_{NPVpg} (%); T_{NPVrg} (%)		60; -	60; -	85; 90	60; -	85; 90	60; 94	85; 94	-	60; 94	85; 94	-	60; 94	85; 94	-	60; 94	94; 94	60; 94	94; 94	60; 94	94; 94	94; 94	
DIMENSION OF FAIRWAY	T (m)							2,3		2,2	2,4		2,4	2,4		2,4								
	T_v (m) + Δ		1,3	1,3	1,6	1,6	2	3,3		3,3	3,4	3,4	3,4	3,4	3,4	3,4	3,7	3,7	3,6	3,6	3,8	3,8	3,8	3,8
	B (m)		35	45		45		55		30	55		35	65		40	75		100		140	120	150	
	B_{zav} (m)	for min l_{sast}	25	35		40		75		40	85		40	95		50	100		120		150	125	170	160
		for max l_{sast}	35	45		45		75		40	90		45	100		55	120		150		180	125	200	160
SAFETY CLEARENS BETWEEN VESSEL AND BRIDGE/POWER LINES	H_{most} (m)		3	3		4		7			7			7			9,5	10	9,5	10	9,5	10	9,5	10
	$_{min}B_{most}$ (m)		35	45		45		45		30	55		35	65		40	75		100		140	120	150	
	H_{kab} (m)	up to 110 kV	15	15	15	15	15	15	15	15	15	15	15	15	15	15	19	19	19	19	19	19	19	19
		up to 250 kV	15,75	15,75	15,75	15,75	15,75	15,75	15,75	15,75	15,75	15,75	15,75	15,75	15,75	15,75	20,40	20,40	20,40	20,40	20,40	20,40	20,40	20,40
		up to 400 kV	17	17	17	17	17	17	17	17	17	17	17	17	17	17	21,9	21,9	21,9	21,9	21,9	21,9	21,9	21,9
	H_{nnkab} (m)		12	12	12	12	12	12	12	12	12	12	12	12	12	12	16,5	16,5	16,5	16,5	16,5	16,5	16,5	16,5
	B_{kab} (m); B_{nnkab} (m)		B_{kab}; B_{nnkab} = širina rubova pokosa kanala ili udaljenost vanskih stopa obrambenih nasipa kod rijeka iznad VPV + 12.0m																					
DIMENSION OF LOCKS	T_{prev} (m)		1,6	2	2,25	2,5	2,5	3,0			4,0			4,5			4,5		4,5		4,75	4,75	4,75	
	$_{min}B_{prev}$ (m)		10	10		10		10.0 - 12.5			12,5			12 - 25			26		24 - 26		34 - 37	24 - 26	34 - 37	
	$_{min}L_{prev}$ (m)		60	60		70 - 75		90 - 190			115 - 190			190 - 210			230		230		260 - 310	310	310	

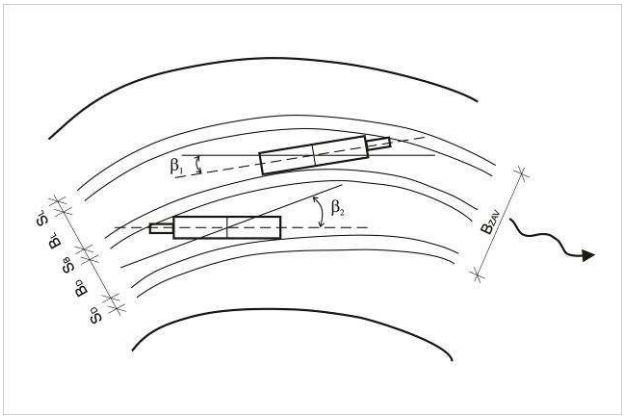
l (m) - length
b (m) - beam
t (m) - maximum draught
W (t) - tonnage
t & s - barges and motor vessels
p - pushed unit
Rmin (m) - minimal radius of curvature
TNPVpg (%) - duration of low navigation level (NPV) for navigation including maximum draught (% of navigable days with NPV or higher levels)
TNPVrg (%) - duration of low navigation level (NPV) for navigation including reduced draught (% of navigable days with NPV or higher levels)
T (m) - depth of fairway for navigation with reduced draught (94% duration)
Tv (m) - depth on a level of draught below NPV (with velocity submersion and skew)
Δ (m) - absolute reserve
B (m) - width of waterway in a stream
Bzav (m) -width of waterway in a curve
lsast (m) - length of proper vessel or pushed convoy

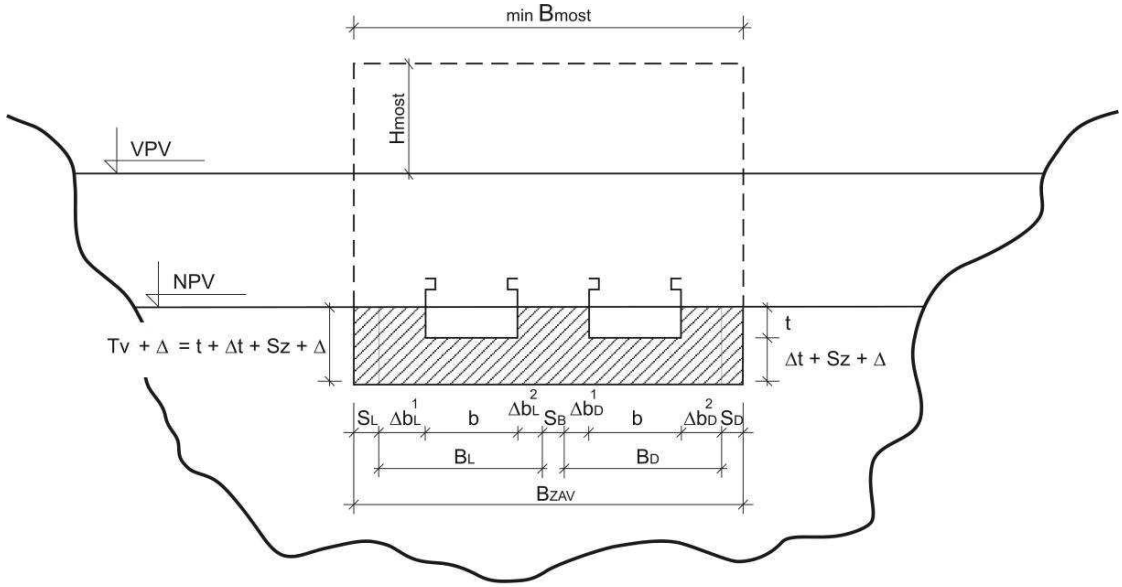
P.1 
P.1.2 
P.2.1 
P.2.2 
P.3.2 
P.2.3 
P.3.3 

H_{most} (m) - vertical clearance under the bridges
$_{min}B_{most}$ (m) - horizontal clearance under the bridges
H_{kab} (m) - vertical clearance under the power lines
H_{nnkab} (m) - vertical clearance under the cables
B_{kab} (m) - horizontal clearance under the power lines
B_{nnkab} (m) - horizontal clearance under the cables
T_{prev} (m) - depth on lock gate
$_{min}B_{prev}$ (m) - minimal width of chamber of lock
$_{min}L_{prev}$ (m) - minimal length of chamber of lock

Annex 1: Classification enclosures

Figure 1. Cross-section and plan view of river bed and fairway in a curve for the appropriate case of passing by





VPV – high navigable water level

NPV – low navigable water level

$\mathbf{B_{zav}}$ – fairway width in a curve

$\mathbf{B_L}$, $\mathbf{B_D}$ – lane width

$\mathbf{S_L}$, $\mathbf{S_B}$, $\mathbf{S_D}$ – additional width

$\Delta\mathbf{b_L^1}$, $\Delta\mathbf{b_L^2}$, $\Delta\mathbf{b_D^1}$, $\Delta\mathbf{b_D^2}$ – vessel side-slip

b – vessel width

$\mathbf{T_V}+\Delta$ – fairway depth

t – maximum draught

$\Delta\mathbf{t}$ – vessel skew

$\mathbf{S_Z}$ – velocity submersion

Δ - absolute reserve

$\mathbf{H_{most}}$ – vertical clearance under the bridge

$\mathbf{_{min}B_{most}}$ – horizontal clearance under the bridge

$\boldsymbol{\beta_1}$, $\boldsymbol{\beta_2}$ – horizontal angle of vessel side-slip

Definitions:

Low navigable water level:

Low navigable water level of freeflow river at certain water gauge corresponds to the water level defined with the discharge duration of the 94 % ($Q_{94\%}$). NPV = $V_{94\%}$ [cm or m.a.s.l.] and in any point of freeflow river it corresponds to the level of water surface with the discharge of 94% duration in a year. It is defined from statistical analysis of discharge duration taking into account 30 years of observation. Traditionally it is used to define flow profile with low water level when navigation at small rivers is performed with reduced draught of proper vessel.

High navigable water level:

High navigable water level of freeflow river at certain water gauge corresponds to the water level defined with the discharge duration of the 1% ($Q_{1\%}$). VPV = $V_{1\%}$ [cm or m.a.s.l.] and in any point of freeflow river it corresponds to the level of water surface with the discharge of 1% duration in a year. It is defined from statistical analysis of discharge duration taking into account 30 years of observation. Traditionally it is used to define vertical clearance under the bridges or power line/cables.

Water level with 60% duration: $V_{Q60\%}$

According to AGN [Annex IIIb] for every waterway class safety navigation should be garantied 240 days during the year for proper cargo vessel with maximum draught. This corresponds to the water level defined with the discharge duration of the 60% ($Q_{60\%}$). $V_{60\%}$ [cm or m.a.s.l.] in any point of free flow river corresponds to the level of water surface with the discharge of 60% duration in a year.

Reduced draught

It is common to navigate when water level is lower than NPV. According to AGN [Annex IIIb] navigation at international E waterways (IV. to VII. class) principally should be provided during whole year except ice period. This means it should be provided during the water levels lower than NPV but reduced draught of 1.2m is permited.

Δt – vessel skew is statical submersion of bow or rudder (it is disregarded at longway axis of vessel) and adoppted value is 0.1m.

S_Z – velocity submersion is consequence of wave system of bow or rudder, vessel streaming velocity, size and form of vessel or convoy, wet area of vessel or convoy, or restricted of waterway and addopted value is 0.2m.

Δ - absolute reserve is always free water between hulk and river bed where navigation has never been performed or never been used in some other way and adoppted values are: for classes I-IV = 0.3m, for class V = 0.4m, for classes VIa and VIb = 0.5m and for classes VIc and VII = 0.6m.

Small radius categories:

R_{min} [m] - minimal radius of river bed axis in curve and

R_{izn} [m] – special radius of river bed axis in curve.

Minimal radius of river bed curve is the smallest radius of river bed axis that allows undisturebed two-way navigation on low navigable water level.

Special radius of river bed curve is 25-30% smaller than minimal. It is not defined generally but in practice it is still used at river sectors when it is not possible to to apply minimal due to some terrain and urban problems. In that case it is applied bigger width of river bed than minimal one calculated for minimal radius.

Navigation lane

It is part of fairway at which navigation of vessel or convoy is performed permanently i.e. a part of water surface that vessel or convoy can achieve during the navigation concerning its width, side-slip in curve or wriggle at stream.

Fairway

Fairway is imagined rectangle in a river cross-section in which navigation is permanently performed i.e. a part of a river cross-section that vessels or convoys could achieved during the navigation concerning width and depth. Horizontally it is defined with fairway lane and security widths. At one direction fairway consists of one fairway lane and security widths. Vertically it is defined with vessel draught, vessel skew and velocity submersion of vessel or convoy that occur during navigation.

Clearance under the bridge is free space between fairway and bridge (Figure 1.). Vertically it is space between water surface and bottom edge of bridge construction and horizontally it is space between inner side of river pier fundament. Here will be defined clearance under the bridge as imagined rectangle defined with width B_{most} [m] and height ${}_{min}H_{most}$ [m] as minimal clearance under the bridge for every class of waterway. It contains extra space that vessel can not achieve neither concerning the widht nor height. During two-way navigation under the bridge it is reduced at one direction due to security of bridge construction but river bed width is not reduced.