

## THE “NS” CATEGORY RULES

### CHAPTER 1

#### DEFINITION AND CLASSIFICATION

The NS Category includes radio-controlled scale models, it means models of ships and vessels which are able to keep afloat and move on water. At the competition, participants should propel their models remotely using wireless technology. These models are constructed according to the plan of their prototype ships in a chosen scale.

F2 classes	Scale models made according to the plan of the prototype ships whose technical documentation confirms that the models are made without ready-made parts and materials.
F2-A	Scale models-copies, not more than 900mm long.
F2-B	Scale models-copies whose length ranges from 900 to 1400 mm.
F2-C	Scale models-copies, more than 1400mm long.
F2-S	Scale models-copies of submarines and other underwater self-propelled vessels with a minimum length of 500 mm.
F4 Disciplines/Classes	This category comprises models made from commercially available kits of plastic parts molded under pressure. Models must have the main distinguishing features and elements of the ship and should look complete.
F4-A	Plastic kit models with distinctive elements and features of the ship; ready industrially made models (RTR “ready to run,” ARTR “almost ready to run”.) Models of this category only undergo steering evaluation.
F4-B	Models made from commercially available kits, except for injection plastic kits. These models participate both in static and steering evaluation. It is permitted to use other materials for amending and improving the outlook of the model; still, the hull and main elements should be taken from the kit.
F4-C	Injection plastic kit models which undergo both static and steering evaluation. It is permitted to use other materials for amending and improving the outlook of the model; still, the hull and main elements should be taken from the kit.
F-FPV	Models-copies of ships and vessels, both self-made and assembled from industrial kits, possessing the main elements of the ship (superstructures, masts and rigging), colouring and designed for undergoing the figure course.

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F6/F7	Precise and approximated functional models-copies of ships, boats and various vessels which take part in team (F6) and individual (F7) competitions. This category also includes various appliances directly related to a certain vessel type (for instance, floating cranes, floating drilling rigs, dockyard cargo machinery, draggers etc.)
F-DS	Precise and close-to-prototype steamship models which are set into motion with a propeller, side or rear paddle wheel. The model should be driven only by means of its steam engine (with one or several cylinders) or a steam turbine. It is allowed to use auxiliary electric launch units for single cylinder or expansion machines to overcome a dead point.
NSS Disciplines/Classes	Precise or approximated sailing ship models constructed in any chosen scale. The static evaluation of these models focuses on the precision of their construction (how true to their prototype these models are).
NSS-A	Models with fore-and-aft/Bermudan sails, also with a wishbone gaff.
NSS-B	Models with fore-and-aft, gaff and lugger rigging (without square sails).
NSS-C	Models with square sails and other types of rigging (e.g., with lateen sails).
NSS-D	Multi-hull models and models with special propulsion units.

1.1. Only models made by a participant or a team are allowed to participate in the competition. Exceptions: models constructed industrially are allowed to participate in classes F4-A and NSS. Models must be the property of the competitor or the team.

1.2. The length of models is not prescribed, except F-2A/B/C Disciplines/Classes.

1.3. The model is controlled wirelessly. The use of a gyrocompass in NSS class is only allowed to control special functions (i.e. to move the internal ballast depending on the tilt). The use of the gyrocompass for navigation / control is prohibited.

1.4. In the NS Category, models of all classes are subject to static evaluation (except for F4-A Class).

1.5. For the NS Category models, the propeller diameter must not exceed by more than 1.5 times and the rudder area must not exceed by more than two times

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the required scale size (except for the NSS Classes). Changes and additions are prohibited (except in the F6/F7 and NSS Classes).

1.6. When measuring the length and width of the NS Category models, it is necessary to measure the model together with the parts protruding over the sides, fore and aft of the ship (only fixed parts are taken into account).

1.7. The choice of the model scale is at the discretion of the participant. Either metric or inch system can be used.

1.8. All parts or interconnected parts that were manufactured industrially or made by a non-participant who is specified in the build brief (model passport) are not subject to static evaluation. Such parts are considered missing and are separately indicated in the model passport. The exception is workpieces such as ropes, chains, pipes, profiled parts, rope yarn etc.

1.9. A model must be presented in the same condition and be as clean as the original vessel, just launched.

1.10. Models constructed from bones and elephant tusks (also partially) are prohibited.

## CHAPTER 2

### GENERAL COURSE REQUIREMENTS FOR THE NS CATEGORY

2.1. NS Category competitions are organized on two different courses:

- for the F2, F4 and F-DS Groups, the course has the shape of an equilateral triangle (see Fig. 1);
- for the NSS Group, the course has a special shape.

Competitions must be organized on lentic water areas and, if possible, protected from the wind (except for the NSS Group).

2.2. At major competitions, it is necessary to set up several courses in such a way as to ensure their optimal passage. In this case, the conditions at the start place and directly on the water must be the same. However, it is necessary to make sure that models of a certain class do not interfere with each other when passing their courses. If the significant number of participants are present, it is allowed to launch 2 and 3 models on the same course one after the other with the necessary time interval.

2.3. The start place personnel during the NS Category competition.

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During the steering evaluation of models of this category, the following persons are present at the start platform.

### **F2, F4, F-DS and F-FPV groups:**

- 1 senior start place referee;
- 2 timekeepers;
- 1 gate referee;
- 1 start place secretary.

### **F6/F7 group:**

- The model function check commission (see paragraph 7.3);
- 1 secretary – responsible for order and security at the start place.

2.4. Minimum start place equipment for the NS Category (except for the NSS Classes).

The start place must be provided with at least the following equipment and devices:

- start platform
- course scheme;
- 12 buoys;
- 1 table and 3 chairs;
- a rain and wind protective shelter for the referees;
- an information board for recording and reporting results;
- 1-2 rescue boats;
- 3 stopwatches;
- a measuring device for 3 seconds (“buzzer”);
- an anemometer for measuring wind speed;
- a timer with a sound signal for 5 seconds for F2-S class.

Additionally for groups F2, F4 и F-DS:

- 1 measuring square, dock-shaped – see Fig. 3;
- 1 ruler with tick marks up to 1000 mm long.

2.5. General conditions for starting and finishing the course.

During the competition, the participant must be at the start place without crossing the border lines of the safety zone clearly marked by the organizers. The participant can move freely within this zone.

After having passed the course, the model must be immediately taken out of the water and the transmitter must be turned off.

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If the transmitter fails during the steering evaluation, the start is interrupted within one minute (except for the NSS Classes). In this case, the start is considered to have taken place. During the evaluation of models of F2, F4, F-DS and F-FPV Classes, the course passed before the forced stop is taken into account. If due to any obstacles the model cannot move or the participant is unable to control it, then he/she has the right to a restart at the end of the course or attempt. The restart is allowed only once and solely in case of interference from other participants, boats, models or foreign objects, including seaweed.

If due to the above reasons the participant has to stop his/her attempt and after clarifying the reasons and circumstances of the interruption, the referee at the start place allows him/her to repeat the passage, then the participant must repeat the entire course. The points that the participant gained during the interrupted attempt are not scored.

During the course passage no one must touch the model.

### CHAPTER 3 TECHNICAL AND SPORT CONDITIONS

#### 3.1. Propulsion.

In F2, F4, F-DS, NSS and F-FPV Groups, the propulsion device of the model must correspond to the original vessel, with the exception of F6 and F7 Classes.

Electric motors, steam engines, internal combustion engines and sails can be used as engines.

The operating voltage of the electric motor must not exceed 42.0 Volts.

The use of auxiliary devices such as phototelegraphy, ultrasonic equipment, GPS navigators and other electrical and electronic devices for navigation support is not allowed.

#### 3.2. Activation and operation of transmitters and remote control.

At the official SMSIF events, only transmitters with a frequency of 27/40 MHz or 2.4GHz can be used. In addition, the transmitters must simultaneously run 12 models in the 27/40 MHz range or ensure the operation of all channels in other acceptable ranges.

Any transmitter and receiver must ensure a quick quartz change. The participant is recommended to have several pairs of quartzes to be ready to change the frequency if necessary.

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The transmitter is used in accordance with regulatory acts of the country in which the SMSIF event is organized. If the necessary information on the use of transmitters is clearly and fully published in the Competition Regulations, the organizer does not accept any claims in this regard.

A flag or a sign indicating the frequency must be attached to each transmitter antenna. When a quartz is changed, the signs are also changed.

The organizers of competitions in radio-controlled classes are recommended to install radio control in order to accurately determine interference arising from other remote services or radio-controlled devices participating in the competition. At the world and continental championships, the use of remote control is obligatory. In order to provide better protection against interference, the distance between the frequencies of transmitters in a separate group must be such that the quartzes in close proximity do not intersect.

If the interference occurs due to remote control and as a result, the model is out of control, then the affected participant must be given an opportunity to retry.

### 3.3. Technical requirements for the equipment of F-FPV Class models.

These models may be self-made or come from industrial kits. In any case, they should possess the main elements of the ship (superstructures, masts, rigging) and colouring corresponding to the vessel type;

only one camera is permitted per model, it may be fitted with a swivel;

the camera is set up directly on the model elements and the distance between the deck and the optical center does not exceed 150mm;

F-FPV Class models are to undergo technical commission before they are allowed to participate in starts on water. The competitor should provide the commission with a build brief (model passport), drawings or assembly instructions.

### 3.4. Buoys (dimensions, structure, anchoring not suitable for use in NSS Classes).

At competitions, the course is marked with buoys. Each buoy must be two-color, and the colors should be clearly distinguishable. The colored stripes on the buoy must be perpendicular to the water surface.

The buoys should be cylinder-shaped, 100 mm in diameter, and protrude over the water at a minimum of 100 mm and a maximum of 200 mm. The buoys must be fixed in such a way that they stand upright in water and the deviation from the gate width is +/- 5% (the measurement is done between the axes of the buoys).

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Anchoring of buoys for courses in F2, F4 and F-DS Disciplines/Classes is done in such a way that the buoy can rotate when touched.

The buoy base is made of materials that will not be damaged in a frontal or lateral collision with the model (polystyrene foam, cork, plastic, etc.)

Fasteners connecting the buoys to each other must be at least 300 mm below the water level. Any fasteners between the courses are not allowed.

### 3.5. Start platform (construction and material)

The start platform is constructed in such a way as to ensure an uninterrupted overview of the area both for the participants and the senior referee's assistants and to provide enough space for transporting the model, thus avoiding obstacles and jeopardies that lack of space causes for models and competitors.

The minimum start platform dimensions (except F6/F7 Classes) are 4 m long and 1.5 m wide (towards the shore).

Access to the start platform and in particular to the place designated for carrying models must be completely safe. The surface of the start platform must have such a structure that even in wet weather the start platform does not become slippery or uneven.

The start platform must not wobble or change its position in any other way under load. The upper edge of the start platform at the start side should not be more than 150 mm above the water surface.

The use of floating start platforms is allowed only if, due to their correct anchoring and stabilization, they are fixed and stable well enough not to rock under loads or wave impacts.

### 3.6. The use of pyrotechnics.

The use of pyrotechnics at SMSIF events must comply with safety rules of the country where the event is organized.

The organizing country is obliged to specify the rules of the import, transportation and storage as well as the use of pyrotechnics precisely, clearly and fully in the SMSIF Competition Regulations.

A competitor is personally responsible for observation of the safety rules. He/she must comply with the organizer's requirements on the method of handling pyrotechnics when transporting and using them.

The organizer is entitled to prohibit the use of pyrotechnic devices if their application threatens order and safety and contradicts the laws of the country where the competition is taking place. This decision cannot be appealed if the rules had been published properly.

CHAPTER 4

PERMITTED NUMBER OF MODELS, MODELS USABILITY AND  
CONDITION OF THE MODEL IN COMPETITIONS

4.1. During world or continental competitions, the organizer is eligible to allow the following maximum number of competitors in each class:

**5 competitors + 1 current champion per country.**

In F2, F4, F-DS and F-FPV Groups, each competitor has the right to participate with only one model in each class in the given competition. It is not allowed to use the same models in F4-A and F4-B Disciplines/Classes within one competition. The NSS Disciplines/Classes, models can be used in other disciplines/classes as well if their rigging is changed and the model prototype also had (has) various types of rigging.

The number of models in F6 and F7 Classes is not limited.

4.2. The following regulations define the use of models in **more than one class:**

models of F2, F4, F-DS and F-NSS Disciplines/Classes can also start in F6 and F7 Classes;

industrially-made models from F-4A Discipline/Class may also start in F-FPV Class;

models of F6 or F7 Disciplines/Classes can start in other classes of NS Category if it does not contradict the rules in these classes.

If a model is used in more than one class, this must be indicated at the registration.

4.3. During the entire competition, each model must remain in the condition in which it was registered and allowed to participate. If, at the start, a model lacks some significant detail or has an added one, the receiver antennas are lost or they get lost while passing the course, then this start is registered without specifying the passage time and without scoring. This provision does not apply to damage or loss of details of NSS Group models if it happened accidentally during the race. The referee at the start place is to make a decision in this case.

4.4. Restarts.

If during the passage through the gate or the passage of the course, the model was damaged while on water, then the competitor has the right to ask for a restart. This also applies to cases when the operation of the propeller or the passage of the model is interfered by foreign objects, aquatic plants, algae, etc.

A restart is allowed if:

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- a) time measurement failed;
- b) there was a severe interference due to the operation of another participant's transmitter and as a result the model became immobilized;
- c) a buoy tore off during the competition.

4.5. Issuance of admission to the start, admission of the model to the competition, determination of the start entry order and informing about it.

Based on the registration results, the competition management must prepare and publish an admission to the start. This document (for example, a start list) contains the following data:

participants' full names, including full names of the participants declared for the start in their classes;

participant's country (citizenship);

name and type of the model prototype;

model scale.

Non-admission to the start must be justified.

Competitions and races may begin no earlier than one hour after the publication of the admission to the start, including admission to the race.

The organizer is obliged to publish the starting list and to make sure that it is delivered to the start on time.

The start order is determined by the organizer.

If there are two or more start places, the competition management must indicate the frequency channels that will be used at each start place.

If the competitors compete in several classes and the competition starts simultaneously from different start places, these participants have the right to change the time or order of the start.

4.6. Calling a competitor to the start.

The competitor must arrive at the start within **1 minute**. During this time, the start place leader calls the competitor out by his/her surname **three times** to arrive at the start place.

If the competitor does not arrive with his/her model within 1 minute, he/she loses the right to this attempt.

While calling out one competitor, the next competitor is announced immediately.

If the competitor does not appear at the start, the next competitor is called after **2 minutes**.

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### 4.7. Preparation time.

The preparation time starts immediately after the competitor has arrived with his/her model at the start and has occupied the start place, which must happen within a short period of time. The beginning of preparation time is determined by the start place leader and he/she clearly informs the competitor about it.

Preparation time for all classes:

- a) Models fitted with an engine – 2 minutes;
- b) F6 and F7 classes models – 5 minutes;
- c) Models fitted with steam engines – 15 minutes;
- d) NSS group models – 4 minutes.

The competitor must be informed of the expiration of his/her preparation time orally and, if possible, visually. This proceeds as follows (except for NSS group):

- for two-minute preparation time, the competitor is informed of its termination every 30 seconds;
- for five-minute preparation time – at the end of each minute;
- for 15-minute preparation time – after the 5<sup>th</sup>, 13<sup>th</sup>, 14<sup>th</sup> and 15<sup>th</sup> minutes.

Before the preparation time is over, the model must be set on water and then the steering evaluation begins.

Any attempt to pass the course during the preparation time is forbidden. If a competitor does not follow this requirement, he/she is disqualified.

### 4.8. Start readiness announcement.

To avoid misunderstanding, the participant must inform the start place referees of his/her readiness by giving a clear sign (for example, raising his/her hand, making an exclamation, etc.). Referees and competitors are recommended to agree on conventional signs. It is not allowed to touch the model after the “ready” signal is given.

If the participant is not ready to start an attempt during the preparation time, it does not score (false start). In this case, the results are not entered into the protocol. The NSS Group models have the right to start later.

### 4.9. Interruption of the competition

Only the chief referee of the competition is entitled to make a decision on the general interruption of the competition.

The decision to interrupt the competition at one of the **start places** is made by **the start place leader** – the senior start place referee.

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If the competition is interrupted for more than 3 hours, all competitors must repeat the attempt or race.

### 4.10. Refereeing and announcement of results.

All results achieved during the competition must be announced or clearly demonstrated directly at the start place by the static evaluation commission. Oral announcements are regarded as preliminary results and must be made in the language of the organizing country and at least in one of the SMSIF official languages. After the points awarded by individual members of the static evaluation commission have been announced, they are considered final results.

The results must be entered into in the protocol. The results are calculated at the end of the competition or static evaluation and, within an hour, the secretary, the competition management (including the jury) announce the preliminary results.

The competition management (including the jury) approve and announce the final official results an hour after the announcement of the preliminary results at the earliest.

After the competition management (including the jury) have approved the results, it is impossible to protest them.

The competitors whose models have not completed a classification course in their class are not awarded any places. In this case, their surnames are written at the end of the protocol in alphabetical order without numbering. The same procedure takes place when the classification course has not been completed during the steering evaluation. The points obtained during the static evaluation are not taken into account. The same rules apply in case when the classification course is failed in F6 and F7 Disciplines/Classes.

### 4.11. Preparation of the protocol.

The protocol of the competition results is to contain the following information:

- competition type and venue,
- competition date,
- model discipline/class,
- competitor's or team's name, surname (or team name), citizenship,
- model name and scale,
- each referee's score, static evaluation results,
- points awarded during the steering evaluation,
- final result,
- competitor's ranking,
- referee's surname, citizenship and his/her number,

- signatures of the chief referee, start place referee and head of model function check commission.

## CHAPTER 5 STATIC EVALUATION

### 5.1. General conditions of the static evaluation

NS Category models must undergo the static evaluation, except for F4-A and F-FPV Classes.

The static evaluation is held separately in each discipline/class and it must precede the steering evaluation.

### 5.2. Technical and organizational conditions of the steering evaluation.

The static evaluation commission is provided with the following:

- a place or room, large enough so that participants and spectators do not interfere with each other. This place must be well lit and protected from the sun; steady tables must be placed for models;
- an isolated room where evaluation commission members can have closed-door meetings;
- suitable measuring instruments to measure the models;
- a sufficient number of paper sheets for the protocol (see the Appendix).

The organizer, the competition management and the referee commission must organize the work in such a way that there is enough time to evaluate each model taking into account the number of models that are subject to evaluation.

The official static evaluation results protocol is kept by the secretary, then it is checked and approved by the head of the competition. Each class has a separate protocol which must contain the following data:

- first name, last name, citizenship of each of three members of the static evaluation commission and the secretary,
- participant's first name, last name, citizenship,
- exact name of the model (name and type of its prototype vessel),
- total number of points awarded by three referees when evaluating the model,
- final evaluation result (number of points).

Each static evaluation commission referee must keep his/her own evaluation protocol according to the Appendix.

### 5.3. Model scales and drawings

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The participant chooses the scale of the future model at his/her discretion.

The participant must present a build brief (model passport) at the registration and later, during the static evaluation, he/she presents all the documents which served as the basis for building the model to the static evaluation commission.

In order for the commission to conduct the static evaluation, the participant must submit the following documents:

- a) a scaled drawing of the model with a side view, top view, a diagram of the hull and main lines, and a cross section;
- b) mandatory indication of the length, width and draught of the vessel;
- c) originals or copies of all documents, museum appendices, shipyard plans, books, newspapers, catalogs, including other appendices and photographs.

If a competitor (author of the model) made the drawings independently, it is necessary to specify exactly the sources of information which had been used. In any case, this does not invalidate paragraphs 5.3.a and 5.3.b including the presentation of the prototype vessel documentation.

The information contained in the utilized sources (literature, photographs, shipyard drawings, etc.) may differ from the technical data and details of the prototype. A participant has the right to rely on various modifications of the prototype including various available sources when making the model. The choice of sources and modifications of the vessel cannot negatively affect the static evaluation.

If the prototype construction was later modified and this was not specified in the original drawings but the changes are nevertheless present, then the participant must justify these modifications by providing reliable sources.

If the competitor does not present any documents, the evaluation is conducted according to the criteria “Quality of work”, “General impression”, “Amount of work”.

If the documents are not presented in full, then, depending on the degree of discrepancy with the documents, points are partially deducted according to the “Compliance” criterion.

### 5.4. Model evaluation.

The presentation and evaluation of models are held separately in each discipline/class and the models must not block each other.

Each member of the static evaluation commission evaluates each of the models and enters the number of points awarded to the models into the protocol sheet, in accordance with the criteria (only integers are used). The result of each model evaluation is the sum total of points obtained for each criterion.

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If there are difficulties determining the discipline/class or category of the model, the decision on this issue is made by the chief referee.

The static evaluation commission holds a closed-door meeting chaired by the chief referee. The purpose of the meeting is to avoid discrepancies in understanding the rules and referees' actions in case of ambiguous situations. If disagreements arise at the meeting, the chief referee is to make the final decision.

It is highly recommended to avoid touching the model during the measurement because this may damage it.

After the meeting, the commission members inspect models included in a class in order to get a general idea of models which will be presented at this competition.

Each commission member evaluates models independently based on the criteria developed for each class.

After the evaluation, each commission member submits his/her results to the secretary who writes them down in the protocol (see the Appendix).

If a model gains 70 – 100 points and the difference between minimum and maximum scores given by individual referees is more than 5 points, then a private meeting of the static evaluation commission takes place.

At this meeting, the commission referees who awarded the model with scores that had led to this discrepancy must justify their decisions.

Based on the result obtained by the given model and on the opinion of the referees participating in the discussion, the head of the static evaluation commission must suggest an average number of points. Voting is possible to confirm the result.

The referees who gave the minimum and maximum scores must re-evaluate the model. At the same time, they may deviate from the suggested average result by no more than 5 points.

To obtain the model evaluation result, the arithmetic mean of the results from all three referees is calculated. The number thus received is the final result that the secretary enters into the protocol.

The major evaluation takes into account the visible model parts. Extra points are awarded for the presence of additional details.

The static evaluation commission has the right to place comparable models next to each other.

The competitor must be present during the evaluation procedure. The commission members have the right to ask him/her questions concerning the model and drawings. At the beginning of the static evaluation, the competitor is obliged to

voluntarily tell the commission which parts of the model were not made by him/her independently.

5.5. The static evaluation commission.

The static evaluation commission includes:

1 head of the static evaluation commission (senior referee);

2 referees;

1 secretary of the static evaluation commission (with no right to vote).

## CHAPTER 6

### F2 AND F4 GROUPS COMPETITIONS

6.1. The static evaluation of models in F2, F4-B, F4-C and F-DS Groups.

The inspection and evaluation of models is held according to the following criteria.

**Quality of work** 50 points maximum

Evaluation of technical execution and quality of the model. Accuracy of shape, visual design of surfaces and colouring.

**Amount and complexity of work** 30 points maximum

Evaluation of the total amount of work required to construct the model. Reconstruction and introduction of additional details are evaluated positively. Particular attention is paid to models that take a significant amount of time to construct, given a high degree of their construction complexity, and to models in F4-B and F4-C Classes, taking into account reconstructions and additions.

**Compliance with drawings** 20 points maximum

Evaluation of model construction accuracy (bearing in mind permissible deviations). Compliance of model details with drawings available for the participant. Evaluation of accuracy of the selected color shade, both for the model and for imitated wood, metal, fabric, ropes, etc.

The following deviations are allowed in classes F2, F4 and F-DS:

Deviations from model length:

500 mm	1000 mm	2000 mm	2500 mm	over 2500 mm
+/-3 mm	+/-5 mm	+/-8 mm	+/-10 mm	+/-12 mm

Deviations from model width:

50 mm	150 mm	300 mm	600 mm	over 600 mm
+/-2 mm	+/-3 mm	+/-4 mm	+/-5 mm	+/-6,5 mm

6.2. Steering evaluation

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The course is an equilateral triangle arranged according to Figure 1. The following configurations are possible: point S can be the main point of the triangle.

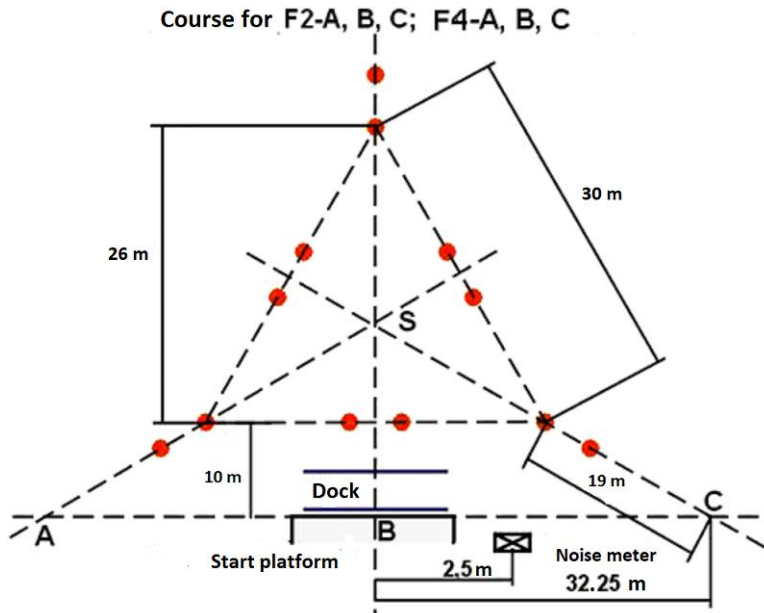
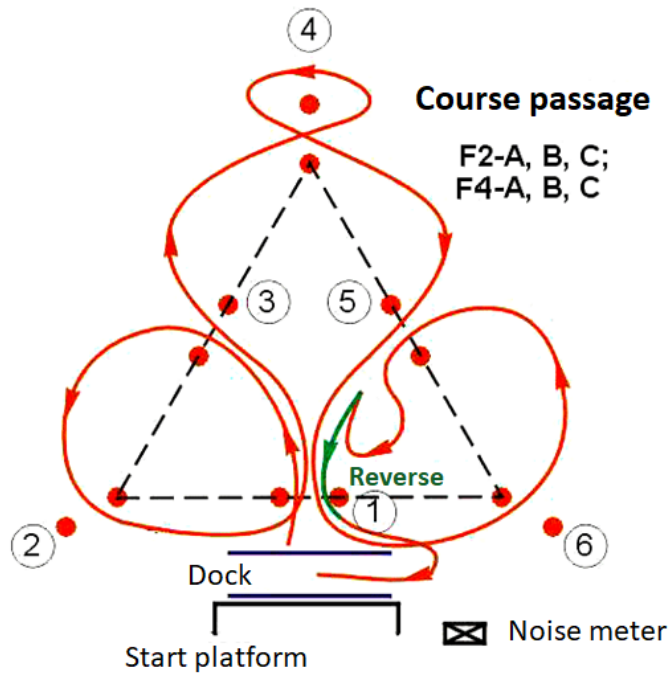


Fig.1

To place the buoys in the most accurate way possible, A-S, B-S and C-S lines, which must intersect in point S, are installed from the shore. When mentally extending these lines, they must pass through the midpoint of the side gate or towards the buoys on the outer vertices of the triangle.

The passage of the course includes 3 attempts which each competitor must undertake. The attempts are separated in time. The order of the course passage is demonstrated in Figure 2.

Fig.2



The evaluation is held during the course passage. The competitor's task is to lead his/her model through the gates placed on the course in a certain sequence. There are 12 gates on the course, 11 of which should be passed while moving forward and one gate is passed in reverse movement.

The maximum evaluation time for each attempt is 7 minutes including the dock maneuver. After the specified time, the attempt is terminated and the points that the competitor had managed to score are taken into account. The competitor is informed about the remaining time after every minute. Once the end of the attempt is announced, the competitor navigates the model to the start platform by the shortest possible route and lifts it out of the water.

The model can pass through each gate only once (except for the repeated passage of the gate in reverse).

The gate is counted as passed if the model has crossed the gate line.

The model is considered to have touched a buoy if, due to the touch, it noticeably turns or moves aside. If the model has touched both buoys while passing through the gate, this counts as one touch.

The gate is considered not passed if **the gate line** on which the buoys are located was passed from the outside of the gate. In this case, all the points for passing this gate are lost.

Gate passage order	Points for gate passage	Buoy touch penalty
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1	6	- 2
3	9	- 3
2	6	- 2
1	6	- 2
3	9	- 3
4	6	- 2
4	6	- 2
5	9	- 3
1	6	- 2
6	6	- 2
5	9	- 3
1 reverse	12	- 4
Docking	10	- 5
Total	100	

If the gates have not been not passed in the proper order, their passage is not scored.

The model must pass through the upper gate (Gate # 4) twice in the specified direction. Each successful passage of the gate scores 6 points. If the model touches the buoy, it loses 2 points (this applies to each gate pass separately).

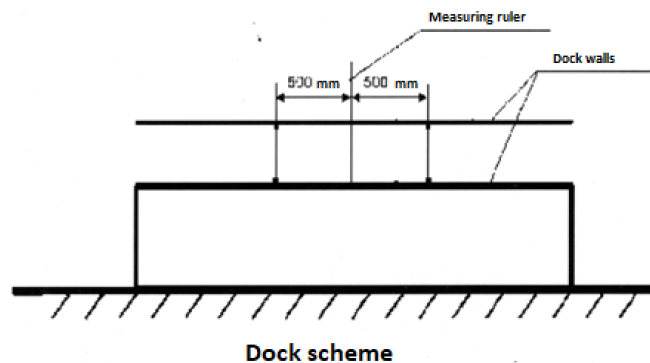
The last gate on the course must be passed **in reverse**, 12 points scored if the gate has been passed successfully. If a model does not cross the gate line or touches a buoy and then passes the gate line moving forward, 12 points are deducted. In case of contact with the buoys, 4 points are lost.

Having passed the last gate, the model must dock by performing a dock maneuver in the designated area. At this time, it is forbidden to try to influence the competitor by calling him/her or giving signs.

The measuring rectangle has the shape of the dock itself (Fig. 3) and on both sides is covered with a soft protective material to ensure model safety. The longer side of the rectangle is parallel to the start platform. The width of the measuring square is determined by using a movable measuring ruler which is placed at the right angle to the start platform.

When performing a dock maneuver, the length of the measuring square is **500 mm** for models of all classes regardless of their length.

Fig. 3



The dock width for groups F2, F4 and F-DS is calculated by the following formula:

$$\text{Model width (mm)} + \mathbf{200 \text{ mm}} = \text{Dock width (mm)}$$

The competitor has the right to bring the model into the dock from either side (left or right).

In order to ensure more accurate recording of the docking maneuver, the start place leader must have a measuring ruler.

The model can enter the measuring square only once. It is not allowed to withdraw the model from the square in order to re-enter and perform the dock maneuver. Should this happen, the competitor scores 0 points.

It is allowed to bring the model into the dock several times if, when doing so, it does not touch the walls and does not enter the measuring square.

For the correct dock maneuver within 3 seconds, 10 points are awarded provided that the model does not touch either the walls or the ruler while staying in the measuring square. The model must also avoid touching the dock walls before entering the measuring square. By the time the model stops completely, its prow must be inside the measuring square whose length is determined according to each model class.

If the competitor has brought the model to a full stop, he/she must clearly and loudly say "Stop" raising his/her hands and no longer working with the transmitter. After that, the referee takes 3 seconds of docking time measuring them with a stopwatch or counting out loud from one to three.

When performing the dock maneuver, 5 points are deducted if one of the following violations is committed:

- a) the model touches the inside or outside of the dock walls,
- b) the model is not immovable during the docking time (the referee must take into account the strength of the current and wind),
- c) the competitor does not say "**Stop**" and does not lift his/her hands off the transmitter,

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d) after the “Stop” signal, the competitor tries to control the transmitter.

If the fact of two or more above-mentioned violations has been established, the dock maneuver is considered unfulfilled and 10 points are deducted.

The dock maneuver is also considered unfulfilled and the participant loses 10 points if one of the following violations is committed:

- a) the prow of the model has been outside the measuring square after entering it,
- b) the model touches both sides of the dock,
- c) the model touches the measuring ruler.

In **F2-S** Class, only 4 additional immersion maneuvers can be performed during the steering evaluation.

If they have been completed successfully, each maneuver will be awarded with 15 points.

The immersions must be performed between gates #1 and #3 and between gates #5 and #1 twice along the course.

- Immersion: 5 points.
- Resurfacing inside the triangle between the buoys (Fig. 2): 10 points.
- Resurfacing outside the triangle between the buoys: 0 points.

The immersion maneuver is considered successful if the model has been fully submerged under water for at least 3 seconds.

After resurfacing inside the triangle between the buoys, the model can perform all the maneuvers to pass the next gate without mistakes. At the same time, it is also allowed to return inside the triangle between the buoys.

Technical equipment (antennas, periscopes, snorkels) can be lowered or taken away while the model is moving. This applies only to those details that are mobile on the original ship.

F-FPV Class models participate in starts following F2 Class Rules, the only difference is that visual control is prohibited for F-FPV models.

Before the starts open, all competitors are to bring their models and equipment to the start area where a separate place is allocated for that purpose. Models and equipment stay there till the end of F-FPV starts.

The preparation time is 3 minutes.

After the competitor gives a “READY” signal, he/she is not allowed to visually control the model (that is, with his/her own eyes).

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Should the referee find the competitor visually controlling the model, not via the video equipment set up on the model, the referee then interrupts the attempt and all the gates after the interruption are to be discarded.

During the attempt, the referee is not allowed to tell the number of the gate the modeler has passed.

The referee uses gestures to notify the secretary whether the gate has been successfully passed or not.

If it is technically and organizationally possible, several models can be on the course simultaneously (2 at most).

### 6.3. Evaluation.

The final result is the sum total of the static and steering evaluation results. When calculating the steering evaluation results, the arithmetic mean of the two most successful attempts is taken into account.

If the result of the first two attempts is the same, then the score of the remaining attempt is taken into account when determining the participant's placement.

If 2 or more competitors score an equal number of points, then to identify the winner, the triangle is passed in the opposite direction: gates 1, 5, 6 etc. If the situation does not change, the start place referee and the chief referee have the right to design a special course. In any case, it is necessary to inform the participants in advance what exactly they will have to do.

## CHAPTER 7

### F6/F7 CLASSES COMPETITIONS

7.1. Competitions in these classes consist of the model inspection and the demonstration that is performed twice. **The inspection precedes the demonstration.**

Only precise or approximate models of ships and boats and various appliances are allowed to participate in competitions; the appliances should be directly related to the vessel type (for example, floating cranes and drilling platforms, port facilities for cargo transshipment). Length and area of the models are specified in paragraph 1.2.

### 7.2. Evaluation conditions.

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The inspection of models includes checking the available functions which are declared in the program and discussing them with the competitor. Then the model construction quality is evaluated.

Each member of the referee commission for checking model functions gives his/her points independently during the demonstration. Preliminary collusion is unacceptable.

The functions demonstration order must comply with the program. If one of the functions violates the order, it is not scored as well as subsequent functions whose order was broken due to the first violation.

Once the attempt in one class is over, the referee commission members have a closed-door meeting.

The results of the first attempt must be posted on the information board. The overall result is announced after the end of the second attempt.

The decision of the referee commission cannot be appealed in any case.

### 7.3. Referee commission for checking model functions.

The referee commission inspects the models and evaluates the demonstration. It includes:

- 1 head of the commission (chief referee);
- 2 referees;
- 1 secretary.

### 7.4. Competitions.

Model demonstration conditions:

The evaluation of the model demonstration while the models are moving to and from the shore (the start place) is possible only if the functions are performed on the models themselves. If the functions are performed from land (the start place), their evaluation is not held.

The demonstration must be historically and chronologically reliable, in an appropriate scale, represent the actions of the ship and its crew when controlling the ship mechanisms and correspond to naval practice.

The use of pyrotechnics is evaluated only if they are actually used on this type of vessel and in the proposed situation. If an electric ignition device is used to ignite the pyrotechnics, it must be separated from the power supply with a switch. The latter is turned on only after the preparation time begins. The use of pyrotechnics must not violate the laws and regulations of the organizing country. For violation of the existing legislation, the participant is disqualified.

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The start platform for the demonstration must be spacious enough (6.0 x 1.5 m minimum). The demonstration must be held in a place that provides a good overview for the referee commission.

Participants and teams choose the form and method of demonstration at their discretion according to paragraphs 7.1. and 7.4. At the registration, the participant presents his/her program in four copies, compiled in one of the SMSIF official languages. The text must clearly state the essence of the demonstration and the program content. Diagrams depicting the movement of models and their functions are attached to the text. The submitted copies are not returned to the participant.

### 7.5. Evaluation criteria

**Model quality** 30 points maximum

The quality of the model construction is evaluated.

**Program performance** 30 points maximum

The commission assesses the general impression of the demonstration, compares the declared and the performed programs and checks the order of functions and maneuvers.

**General impression** 20 points maximum

It includes evaluating the performance scenario and the purpose of the functions (depending on the model and type of vessel) as well the program content (maneuvering, group operation, supply and rescue operation, naval battle). The content of functions that are not necessarily related to this vessel type.

**Amount of work** 20 points maximum

It implies evaluating the degree of functions/maneuvers complexity and their interaction as well as the number of functions/maneuvers and their technical realization.

The total number of points is 100 (maximum).

### 7.6. Competition procedure.

Competitors are given two attempts at competitions. The interval between them must be sufficient for the competitor to have enough time to prepare his/her model for the second attempt, fully observing the technical standards.

The time limit for the program performance is 15 minutes. The preparation time is 5 minutes in addition to 15 minutes of the program.

In F6 Class (team maneuver), a team of competitors (**8 maximum**) starts simultaneously with several models. In F7 Class (individual maneuver), a competitor can demonstrate one or several models.

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Competitors and their assistants must bring their models to the start place and put them onto the start platform. It is not allowed to launch the models into the water, but before the preparation time begins, models of port facilities, mooring berths etc. may be set on water and attached to the start platform, provided their use is a part of the program.

After the team captain (F6) or the participant (F7) demonstrate his/her readiness with a gesture, the head of the referee commission indicates the beginning of the preparation time and informs the participants about it loudly and clearly. Only after that the participants have the right to turn on the transmitters. It is necessary to inform the participant about each expired minute during the entire preparation time.

Once the beginning of the preparation time has been announced, the participants can launch their models into the water. The participants must start the demonstration during the preparation time, otherwise the competition is interrupted and the evaluation is not held. The participant or the team captain gestures about his/her readiness. After this signal has been given, it is not allowed to touch the models. If the competitor touches any model, it does not participate in the demonstration. As soon as the demonstration starts, the assistants must leave the start place immediately.

Once 15 minutes which are counted from the end of the preparation time have elapsed, the commission announces the end of the demonstration. The actually displayed actions and functions are evaluated.

The models must be immediately lifted from the water, the transmitters must be turned off, and all equipment and models must be taken away from the start.

7.7. The evaluation is held in two categories – juniors and seniors. Participants in F-6 Class (team competitions), where there are competitors of different ages, are regarded as seniors.

The score of the most successful attempt out of two is taken into account.

To determine the result of the demonstration, the arithmetic mean is calculated from the sums of points awarded by the three referees. The obtained number is the final result of the demonstration.

The secretary immediately enters the final result of the evaluation into the protocol.

Medal awarding is held according to the results, moving from the highest to the lowest result.

In addition to being given a medal, the competitor is awarded the Champion title. If two competitors have equal results, they are awarded the same places i.e. the next place is not awarded.

CHAPTER 8  
MODELS WITH A STEAM ENGINE

8.1. This class includes precise and close-to-prototype steamship models which are set into motion with a propeller, side or rear paddle wheel. The propulsion of the model must be provided by the engine drive whose working medium is water vapor: steam engine, steam turbine, etc.

The use of auxiliary launch units for single-cylinder or expansion steam engines is allowed only to overcome the dead point of the machine.

The competition consists of two parts: the static evaluation of the model and its engine and the steering evaluation.

8.2. Static evaluation commission.

The static evaluation commission includes:

1 head of the static evaluation commission (senior referee);

2 referees;

1 secretary of the commission (with no right to vote).

8.3. The model evaluation criteria are similar to F2/F4 classes:

**Quality of work** 50 points maximum

**Amount and complexity of work** 30 points maximum

**Compliance with drawings** 20 points maximum

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100 points maximum

8.4. The evaluation of the model engine is the sum total of the steam engine, boiler and auxiliary equipment evaluations, and general impression of the model propulsion system.

Engine evaluation criteria:

Steam engine 40 points

Boiler 30 points

Auxiliary equipment 20 points

**General impression** 10 points

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100 points maximum

Steam engine evaluation criteria:

Constructed independently: with a flat or round spool valve 40 points

Oscillating cylinder engine 35 points

Engine from the kit: with a flat or round spool valve 35 points

Oscillating cylinder engine 33 points

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Ready-made engine: with a flat or round spool valve	32 points
Oscillating cylinder engine	30 points
<u>In the absence of documentation</u>	<u>minus 10 points</u>

### Boiler evaluation criteria:

Constructed independently	30 points
Boiler from the kit	27 points
Ready-made boiler	25 points

### Auxiliary equipment evaluation criteria:

Constructed independently	20 points
Parts from the kit	18 points
Prefabricated parts	16 points

<u>General impression of the model engine</u>	10 points
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At the registration, the competitor must present the build brief of the model (model passport) and a general diagram of the steam engine, including all auxiliary equipment and vessel functions.

To confirm the safety of the equipment, the competitor must also attach an equipment certificate to the model passport (for example, an application addressed to the competition management):

### **Application sample:**

*I ... (full name, the participant's exact residential address) hereby declare that the steam engine, gasometer and boiler in my model (model name, length, width, weight; other details specified in the model passport) were manufactured and function in accordance with ... (the country represented by the participant) regulations for handling high-pressure tanks. These devices were manufactured and tested properly.*

*I commit myself to complying with the safety requirements that are specified in these SMSIF Rules for the NS Category.*

*Place, date and signature*

For safety reasons, the preparation of models and heating of steam machinery must be carried out in a place fenced off from the audience. Also, in order to prepare the models, it is necessary to distribute the frequencies among the competitors in a timely manner.

### 8.5. Steering evaluation criteria.

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The evaluation of models in this class is conducted according to the rules of F2/F4 Classes.

The competitor has three attempts; each of them takes a maximum of 15 minutes.

When determining the results, the arithmetic mean of the two most successful attempts is calculated; the result of the remaining attempt is taken into account if two competitors have equal scores.

The final result is the sum total of the static and steering evaluation results.

Steering evaluation		100 points maximum
Static evaluation	2 x 100 points	200 points maximum
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The best result		300 points maximum

### CHAPTER 9

#### MODELS-COPIES OF SAILING SHIPS–NSS GROUP

##### 9.1. Classification of models by their rigging type:

NSS-A – models with fore-and-aft/Bermudan sails (including a topsail), also with a wishbone gaff;

NSS-B – models with fore-and-aft, gaff and lugger rigging (without square sails);

NSS-C – models with square sails and other types of rigging (e.g., with lateen sails);

NSS-D – multi-hull models and models with special propulsion units.

The number of masts and sails on a model (for example sloop, cutter, ketch, schooner) is not limited and is not taken into account when is assigning the model to a particular class. Vessels additionally equipped with rotating cylinders or a fixed bearing surface, belong to the NSS-D Class.

The mentioned classes are formed solely on the basis of the rigging efficiency. The criterion of efficiency is the so-called “move to the wind”. In case of mixed rigging, the model class is determined by the least effective type of sail. Thus, a schooner with an oblique fore-gaff and a Bermuda mainsail belongs to the NSS-B Class while a gaff cutter with one square sail belongs to the NSS-C Class.

##### 9.2. Static evaluation.

###### 9.2.1. General provisions.

At the static evaluation, the competitor must present all the documentation on the prototype of his/her model. The documents must specify the main

characteristics of the vessel (total length and width of the hull, length of the waterline, length of the bowsprit and jib-boom, including the mast coat, height of the masts, draught, size and shape of the additional swing/lifting keel, including its position relative to the vessel, windage and displacement tonnage). Besides, the documentation should include a plan of the vessel and its hull, a detailed drawing of the deck and rigging. Drawings of the model are also accepted as documentation. But the accuracy of models constructed according to the presented drawings must be justified with the help of additional documents. Plans of similar vessels are also accepted as evidence, but their similarity must be justified. Assembly manuals for models constructed from kits are NOT documentation.

At the static evaluation, the sails of the model must be raised so as to correspond to the maximum windage of the model (indicated in the model passport). If reefing a sail (replacing the sail which is set in case of low wind force with a smaller storm sail) is involved, it is necessary to demonstrate the storm sail at the static evaluation; it is further taken into account while assessing the execution of the model.

#### 9.2.2. Evaluation

The static evaluation is held by a commission which consists of three persons. The model is evaluated according to the static evaluation regulations of NS Disciplines/Classes of models. If a competitor constructed his/her model individually, following the drawings, it can score 100 points maximum. Models constructed from industrial kits can obtain 80 points maximum. The points are distributed as follows:

##### Models constructed individually according to the drawings:

**Quality of work** 30 points maximum

The quality of the model hull, including additional structures, and level of detail are evaluated (the part of the model above the waterline undergoes the evaluation).

**Compliance with drawings** 30 points maximum

The compliance degree of the model with the presented documentation is evaluated.

**Rigging** 30 points maximum

The rigging quality is evaluated.

**General impression** 10 points maximum

##### Models constructed from kits:

**Quality of work** 25 points maximum

The quality of the model hull, including additional structures, and level of detail are evaluated (the part of the model above the waterline undergoes the evaluation).

**Compliance with drawings** 25 points maximum

The compliance degree of the model with the presented documentation is evaluated.

**Rigging** 25 points maximum

The rigging quality is evaluated.

**General impression** 5 points maximum

The points for the “Quality of work” and “Rigging” criteria are awarded by the commission only for individual work (i.e. tidiness of execution, level of detail, proportionality, etc.). The commission has no right to add points for the supposed complexity of the construction or for the fact that the model has been constructed by a junior.

If the amount of the presented documentation does not comply with the requirements of paragraph 9.2.1, the commission subtracts a certain number of points for the “Compliance with drawings” criterion.

The static evaluation commission must evaluate and award points separately for each of these criteria. An information board with detailed evaluation criteria must be prepared one hour before the beginning of the first evaluation at the latest. The arithmetic mean of the sum of each referee’s points is rounded to hundredths.

If, at the static evaluation, the model is awarded 10 points or less according to two or three main criteria (quality of work, compliance with drawings, rigging), it is recognized as not corresponding to the prototype and disqualified from the competition.

9.2.3. Permitted deviations from the prototype.

The following deviations from the prototype do not affect the results of the static evaluation:

1) Increase of model draught by no more than 150% in classes NSS-A and NSS-B, by 200% in NSS-C and by 120% in NSS-D (100% = the prototype draught in accordance with of the model scale). When a vessel is equipped with additional stabilizers on the keel, the draught with retracted stabilizers is considered as 100%. The stabilizer in the released position can exceed the maximum allowable draught only if the size, shape and position of the keel fully

correspond to the prototype and the keel is released and retracted by remote control. The centerboard on the centerboard boats is regarded as a fixed keel and must be constructed accordingly. The centerboard boats are not subject to the restriction on additional swing/lifting keels. The draught of the model can be increased with the help of an additional keel as well by changing the lateral one (i.e. changing the shape of the underwater part of the model). The minimum permitted thickness of an additional keel or elongated deadwood must be at least 5% of the maximum width of the model hull. The minimum allowable thickness of a swing/lifting keel is 1/3 of the corresponding thickness of the additional keel or elongated deadwood.

2) It is allowed to use additional external ballast (for instance, the so-called "lead bombs").

3) If the maximum allowable draught complies with requirements, the increase in the rudder blade area is not limited.

4) Sheet tackles can be removed. Sheets can be fixed directly to the cleat or pin using an S-hook or some other mechanism that is quickly activated.

5) The forestay can be pendulum-shaped.

6) The receiver antenna can be mounted on the rigging.

7) The model may lack the internal equipment of the prototype vessel.

8) It is permitted to place a fender on the stem or on the jibboom end.

#### 9.2.4. Definition of a model constructed from a kit.

1) A model is considered constructed from a kit if it is made from an industrial serial kit (commercially available now or in the past) which includes ready-made assembly units and individual parts (for example, hull, deck, centerboard, masts, etc.). This also includes models-copies that are finalized by competitors using the kit (for example, casts made from the ready-made hull and constructing a copy of the kit model) if changes in at least one of the key dimensions (length, width of the vessel) are less than 5%. The dimensions of the original hull from the kit are considered to be 100 %.

2) Using a deck from a kit and its subsequent change, which results in the creation of a model fundamentally different from the one offered by the kit manufacturer, is considered independent work with application of an industrial workpiece. But this is possible if the conditions of paragraph 1) are met.

3) The use and construction of limited series hull planking is considered independent work provided that with respect to the prototype and/or main dimensions (see paragraphs 1) and 2)), the resulting model does not coincide with any of the industrial kits. If such planking coincides with an industrial workpiece, the provisions of paragraphs 1) and 2) come into force.

4) The use of ready-made hulls does not deteriorate the results of the static evaluation.

### 9.3. Competitions.

#### 9.3.1. Course.

The active part of the competition consists of a race (regatta). The organizer must arrange the course in such a way that the start begins against the wind. Besides the traditional triangle, regattas can be held in a circle (if local conditions allow to do so), for example, sailboats can circumnavigate an island; in this case, the competitors follow their models along the shore. Either way, the course must be organized so that all its segments are passed in the wind.

The course must be located in close proximity to the shore in order to enable both the competitor and the referee commission to observe the race while being at the start line, regardless of changes in the wind direction.

The minimum course size is a 60 x 40 x 40 meters triangle. The triangle dimensions must correspond to the number of participating models. The length of the start line (in meters) must be sufficient for the simultaneous start of at least twice as many models as are actually competing. Also, the longest side of the triangle is at least 3 times the length of the start line.

The course is marked with buoys which are fixed using two weights. When anchoring the buoys, the heavier weight must be on the bottom and the second, smaller in size, must be in water at half the depth. Both weights are connected with a cable which passes through the ring on the buoy underside. The buoys must be cylinder-shaped, their minimum diameter is 300 mm, and they must protrude from water by at least 400 mm. It is allowed to use sphere-shaped buoys with a diameter of at least 400 mm. The buoys should be made from such a material that the model does not get damaged when contacting them. In order to improve their visibility, the buoys are painted in bright clear colors. To facilitate detecting the fact of a model touching a buoy, it is recommended to manufacture the buoys with two bicolor longitudinal stripes.

#### 9.3.2. Competition procedure.

The minimum number of participating models is 3. It is recommended to allow no more than 20 models to start simultaneously. If there are more than 20 applications for participation in one class, the starting group can be divided into several subgroups, the final distribution is carried out by drawing lots. If the number of applications in one or several classes is less than required, a mass start is allowed for NSS-A, NSS-B and NSS-C Classes; still, the evaluation is performed separately for each class. Similar measures are taken in case there is an

insufficient number of juniors/seniors. However, NSS-D Class models can only start in their own class.

Competitors must arrive at the start 15 minutes before the expected start time of the race. At least 5 minutes before the preparation time begins, the start place leader informs the competitors about the course trajectory, the start direction and the time left before the start is over.

Before the start itself, the start place leader announces the beginning of the 4-minute preparation time. During the preparation time, competitors are informed about every expired minute. Immediately before the preparation time is to expire, the following countdown is done for a minute: 1 minute before the start, 40 seconds, 20 seconds, 10, 9, 8, ..., 3, 2, 1, Start!

During the last minute before the start, the models which had been launched into water must not touch or cross the start line or its continuation. The models which had arrived late to the start (late-comers) cannot be launched during the last minute, they are launched into water after the “Start” signal has been given.

At international competitions or championships, announcements about the beginning of the preparation time and the countdown must be made into the microphone in Russian or English.

The models must wait for the beginning of the mass start at the start line marked with two buoys. The start place leader or the automatic starting device gives a start signal at the end of the countdown. False start (i.e. crossing or touching the start line during the countdown) is penalized by a turn (i.e. the model must turn 360°). If the model had started too early, it should return to the pre-start area and then start again after the last model has started. The penalty turn in this case must be performed during the first race lap (see paragraph 9.3.4). After the start signal, each model must cross the start line marked with two buoys.

The time required to complete the course is measured for each model with two parallel stopwatches. For the first attempt, 1 hour is provided (max. 10 minutes can be added). The number of race laps on a triangular course is calculated based on the time taken to complete the first lap. The number of laps is determined depending on the number of competitors and it is directly linked to the time it took the fifth model (8 or more competitors) or the third model (fewer than 8 competitors) to pass the course. Additionally, 10 minutes are left as a reserve.

*Example:*

The number of competitors is 12, the fifth model completed the first lap in 5 minutes 54 seconds (rounded to 5.9 minutes):

Thus, this attempt includes 8 laps.

The number of laps must be rounded down (for example, 8.9 to 8).

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The referee commission calculates the number of laps immediately after the decisive model has passed (i.e. the fifth or the third) and announces the result. When several classes start at the same time, the number of laps is calculated separately, depending on the number of competitors in each class.

All models must be on the course during the race time. At each crossing the start and finish line or when passing by the start place, the competitors must report their assigned starting number. The referee commission must inform the competitor individually about the beginning of the last race lap and about the arrival at the finish line. Once the race time is over, the senior start place referee gives the FINISH signal. From that moment on, all models crossing the finish line are considered finishers. Competitors whose models were on the course at the time of the FINISH signal are additionally given 8 minutes; during that time, they can complete the lap they had started. Thus, the actual race participation time of the model is the time from the START signal until the model crosses the finish line after the FINISH signal has been given. This time is recorded by timekeepers and entered into the starting protocol for each race participant, together with the number of full laps completed by their models.

All competitors whose models have not completed the initiated lap during extra time after the FINISH signal, have their race time and the number of completed laps written down in the protocol.

The laps and time from the start to crossing the finish line are counted on each lap for all models on the course.

If a competitor commits more than two violations (warnings) during the race, he/she is disqualified from this race.

If one of models is damaged as a result of a collision, the offender (who has caused the collision) is disqualified from this race.

If a model had to be repaired because of damage it had suffered as a result of a collision during the race or its parts were lost due to external impact, then a competitor with such a model can continue to participate in the competition without losing points.

### 9.3.3. Navigation/Right of way rules.

- 1) Contacting other models should be avoided during the race.
- 2) When bypassing a turn sign or an immovable obstacle (for example, a shore), a model coming from the inside has the right to be at least 5 meters away from the sign or the immovable obstacle (i.e. the inside model gains an advantage over the outside one).
- 3) If two models are on opposite tacks, then the port tack model should keep away from the starboard tack model. If models are on the same tack and are

codependent, the windward model should keep away from the downwind (leeward) model. The models are considered to be on the same tack if the extreme front point of one model is in front of the extreme end point of the other model when placed on a parallel line in the course direction, and the lateral distance between the models is so small that a shift in position towards the other model will lead to a touch.

4) The model whose sails are located on the larboard side has an advantage over the model with sails on the starboard side. In this case, the position of the mainmast (fore-and-aft rig models) or mizzenmast is decisive.

In order to avoid causing damage to models, the right of way rules must be understood in accordance with the above provisions.

The referees must monitor compliance with the right of way rules of the sailboats. A model that pushes other models, touches a turn sign or skips it altogether is punished with a penalty turn (i.e. the model must turn 360°). The model must perform the penalty turn on the same lap where the violation was noticed. In order to make the turn, the competitor must choose a moment when his/her maneuver will not interfere with other models, inform the referees about the intended turn, obtain their permission to start the turn and only after that the competitor should perform the penalty and then tell the referees about its completion. The referee must monitor the penalty turn and register the removal of the penalty. When making the turn, the competitor must first of all not interfere with other models. In case of a repeated or an intentional collision that violates the right of way rules, the referee has the right to disqualify the competitor.



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$$R \geq 1 \quad R_{\log} = \frac{R}{R^{(2 \log R)}}$$

$$R < 1 \quad R_{\log} = R * R^{(2 \log R)}$$

$L_{WL}$  = actual waterline length

$S$  = windage ( $m^2$ )

$V$  = displacement tonnage (kg)

$K$  = selected constant ( $K = 456$ )

Thus, each model has its own racing handicap ( $R_{\log}$ ) which is multiplied by the time of passing the course. The result is used to determine the competitor's place.

$$T_Z = T * R_{\log}$$

$T$  = race time (sec.)

$T_Z$  = the time in which the model completed the race (sec.)

The model with the least (best) time wins this attempt and gets 50 points. Further, the number of points and places is calculated according to the following proportion:

$$P_n = \frac{T_{Z_1}}{T_{Zn}} * 50$$

$P_n$  – the number of points scored by the nth model

$T_{Z_1}$  – the time in which the winner completed the course

$T_{Zn}$  – the time in which the nth model completed the course

*Example:*

3 models came to the finish line, their course passing time is 1000, 1200 and 2000 seconds respectively. The winner of this attempt is the model which finished the race in 1000 seconds and it gets 50 points. The number of points for the other two models is determined as follows:

$$P_2 = \frac{T_{Z_1}}{T_{Z_2}} * 50 = \frac{1000}{1200} * 50 = 41,67 \quad \text{the number of points for the second}$$

model

$$P_3 = \frac{T_{Z_1}}{T_{Z_3}} * 50 = \frac{1000}{2000} * 50 = 25 \quad \text{the number of points for the third}$$

model.

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The results are rounded to hundredths.

The total score consists of at least 3 triangular course races and the worst result is discarded. The remaining results are summarized with the static evaluation results. The winner scores the maximum number of points.

If two or more models score an equal number of points, then the third (least successful attempt) is taken into account; if the third attempt results are also equal, the winner is determined by the static evaluation, but if in this case the result is still the same, then the winner is chosen by drawing lots.

### 9.3.5. Final results, issuing the protocol.

The competition results must be registered in the protocol and published in accordance with the competition rules. The protocol must contain the following information:

Type of competition and its venue;

Calendar dates of the competition and of approving its final results;

Sport disciplines/classes;

Competitors' names, surnames, their age groups;

Countries which the competitors represent;

Names and scales of their models;

Scores of each static evaluation commission referee, given to each competitor;

Steering evaluation scores of each participant in each attempt;

Final result of each competitor and team;

Place of competitor and team;

List of referees, together with their positions and qualifications;

Name, surname of the official authorized SMSIF representative;

Date of approving final results of the competition.

The NSS Group protocol must contain additional information about each competitor's model and result:

Waterline length, windage, displacement tonnage,  $R_{log}$  parameter;

Time in which the model completed the race (for each attempt);

Number of points and place (for each attempt).

The final protocol is certified by the chief referee's and chief competition secretary's signatures as well as the organizer's stamp.

### 9.4. General provisions.

1) The NSS Disciplines/Classes rules are valid only in their Russian and English versions. Individual translations into national languages may be used solely for reference purposes.

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2) Only a special “NSS Class model certificate” is used for NSS disciplines/classes. Other versions of the model build brief (passport) are not valid. The model passport submitted to the static evaluation commission must be completely filled out and the information contained therein must be exhaustively confirmed by the attached documentation.

3) The competition results must be recorded in the protocol and posted on the information board within an hour at the latest after the beginning of the next attempt. The protocol must contain the following information: competitor’s surname, name of the model, frequency at which the race was held (the number of the allocated channel), waterline length, windage, displacement tonnage,  $R_{log}$  parameter, static evaluation results (number of points), time in which the model completed the race, number of points and place (for each attempt), total number of points, final place.

At international competitions and championships, the posted protocol must be written in English.

4) The only propulsion type that is allowed in the NSS Class is the sail (this rule also applies to models-copies additionally equipped with a motor). During the competition, the competitor must clearly demonstrate that the motor of these models does not function (for example, the competitor can remove the propellers or close the water cannon nozzle). Disconnecting the motor from the transmitter and/or from the battery or turning the switch to the closed position does not confirm that the motor does not function.

5) It is not allowed to use movable ballast which was absent on the prototype. The overall ballast of the model must be fixed in such a way that it does not change its position during the race. If the model prototype had movable ballast, it can be left in the same position. In this case, the ballast can only move across the model.

6) To make the model sail more similar to its prototype, materials which bear visual likeness to the original ones are generally used. It is allowed to replace cotton or linen fabric with polyamide/polyester (for example, the parachute cloth). The application of film sails is possible only if the original sails were made of the same material and this must be proved by the documents (schemes and drawings). If the model does not comply with the requirement on the visual similarity of sails, then it is given 0 points according to the “Rigging” criterion at the static evaluation. While evaluating the degree of visual similarity of sails with the prototype, their shape is taken into account and it must exactly correspond to the original one. No deviation from the shape is allowed for the convenience of sail measurement.

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7) The condition of the model must be the same at the static evaluation and the race. Windage change is allowed depending on the wind force. Subject to compliance with the prototype, the sail may be reefed as well as the removed or replaced with a smaller one. It is allowed to change only those sails that were demonstrated during the static evaluation. Additional sealing of the model during the competition is also possible.

8) The racing handicap calculation is based on maximum windage according to the model scale, weight of the model ready to start, and actual waterline length. The foresail area is replaced by the surface area of the sailing triangle. The sailing triangle consists of:

a) the intersection point of the front bolt rope of the foresail outer part with the deck (or with stem, jibboom or bowsprit);

b) the intersection point of this line with the front edge of the mast or topmast;

c) the middle (mainsail) sail boom horizontally projected onto the front edge of the mast (for models with a mainsail or fore-gaff, the projection of the tack is used).

If the sail has a rounded boltrope, then this fact is not taken into account when calculating the sail area (the corners are connected by straight lines and the area of the resulting figure is calculated). The part of the sail surface that is superimposed on another sail or on the foresail triangle is not taken into account. The topsail and gaff areas are calculated using the formula for the rectangle area.

9) The area of the spinnaker is not taken into account.

10) The square sail area of the NSS-C Class models is also taken into account even if the square sail is superimposed on another sail or on the foresail triangle.

11) The permissible increase of the model draught specified in paragraph 9.2.3 also applies to the constructive waterline. The actual waterline may be half above but not below the constructive one (CWL). Therefore, the minimum weight of the ready for launch model cannot be less than its theoretical displacement tonnage.

12) As a rule, the race is held at wind force up to Beaufort 4 inclusive. During the attempt, the wind force must also be less than 4.5 Beaufort. Otherwise, the attempt is interrupted and repeated later under more favorable conditions. If it is not possible to determine the required number of laps during the first 25 minutes of the attempt, due to the absence of wind (according to paragraph 9.3.2), then the attempt is interrupted and held anew. If the weather changes abruptly during the

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attempt, when even during the added 10 minutes no model is able to make the required number of laps, this attempt is canceled and held again.

13) Each competitor must have at least 3 pairs of quartzes of different frequencies. The organizer chooses one of the frequencies as the racing frequency for a given model. If a competitor does not use the assigned frequency, he/she is disqualified. The competition organizer distributes the frequencies during the registration of competitors at the latest.

14) Models from kits may participate in the race. In this case, the competitor must provide the model plan taken from the kit and additional documentation.

15) It is allowed to use standard ready-made parts, fasteners and other workpieces when building the model. The parts which have been purchased by the competitor are considered missing and are not awarded points at the static evaluation.

16) According to paragraph 9.2, the evaluation of models during the race is held separately for each specified class, regardless of whether the course has been passed by all models together or separately. Similarly, should juniors and seniors have a mass start, the age categories are not mixed when evaluating the models.

17) For any calculation of rates or points, the numbers are rounded to hundredths.

18) It is forbidden to use external counterweights on the boom of the oblique foresail if they protrude beyond the dimensions of the sail/boom.

19) It is forbidden to make oscillatory movements with the rudder blades and the sail in order to move forward. Noncompliance is punished with a penalty turn. In case of a repeated violation, the competitor is disqualified from the attempt.

20) It is allowed to use a winch to lower the boom, including for those models whose prototype lacks this device.

21) The competitor has the right to take measures aimed at improving manageability and endurance of the model during competitions on the water (for example, by installing the fender). These additions must be demonstrated at the static evaluation. If the presented documents do not contain any information about these devices but they are nevertheless used during the race, then the corresponding number of points is deducted from the static evaluation results.

22) The competitor has the right to take additional measures in order to improve water resistance of the model (for example, sealing hatch covers with adhesive tape). These measures are considered to have the aim of improving the model safety under adverse weather conditions that threaten the model. The changes are not implemented during the static evaluation, but directly during the competition on the water depending on the weather and in a short time. Measures

aimed at enhancing the model manageability and water resistance cannot be taken simultaneously.

23) The square sail of the NSS-C models must be controllable and contribute to creating traction force during the race. The referee commission or the start place leader has the right to demand confirmation of its controllability. This requirement does not cancel subparagraph 7) of paragraph 9.4 which describes the right for reefing a sail or removing one of the sails. Models with an uncontrollable square sail (i.e. its replica) are transferred to NSS-A or NSS-B Classes (depending on their rigging type).

24) A random check of the model parameters may take place either during the static evaluation or immediately after the end of the attempt. The acceptable deviation from the data specified in the model passport is +/- 5 % maximum, while the actual  $R_{log}$  parameter may deviate by +0.02 from the corresponding indicator that can be obtained using the model data specified in the passport. Before measuring the model, it is necessary to remove the water that got inside it during the race. The maximum windage is used for measuring the maximum sail area, including the case when not all sails were set during the race (i.e. the area of the sails that provide the maximum windage is measured).

25) If a model is damaged or loses one of its parts as a result of an accident during the competition or if a model has to be repaired with a reservation to such an accident, then the model is allowed to participate in the competition without any loss of points.

### 9.5. Start place requirements for NSS Class models.

Compliance with the following requirements for the start place equipment is mandatory at international competitions and championships. At national competitions, these requirements are advisory in nature unless differently specified in other rules.

#### 9.5.1. Start place requirements – technical equipment:

- a rescue boat designed for two persons and equipped with an engine;
- an anemometer (with the Beaufort scale) fitted with an information storage medium on a tripod. The device is fixed in an open area;
- a radio frequency scanner – with a logarithm function;
- a pair of binoculars;
- shelter and seating for the referee commission;
- 3 stopwatches;
- an intercom system for each start place (not necessary if the competition is only held at the NSS Class start place);

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- a start platform whose design meets the requirements of Technical and Sports Conditions for NS Disciplines/Classes competitions. Start Platforms (Materials and Structure). The maximum loading capacity is at least 500 kg;
- buoys with 2 weights;
- a large enough measuring tank for the participating models, a hand mirror and a lighting fixture to determine the waterline length;
- a weighing scale with maximum load of at least 50 kg and accuracy +/- 50 g to determine the model displacement tonnage;
- life jackets for lifeguards and model owners;
- a loud speaker.

### 9.5.2. Start place requirements – staff:

- the staff/assistants' functions must be clearly indicated (for example, using a “SAR” sign for lifeguards);
- the start is staffed with: 1 start place leader, 2 referees at buoys to monitor compliance with the rules, 1 secretary and 3 timekeepers (any pre-instructed persons who do not have the referee status can be timekeepers);
- at least 1 lifeguard who retrieves a model in a boat together with the competitor if necessary.

### 9.5.3. General start place requirements:

- at international competitions and championships, communication at the start platform takes place in Russian and/or English (this requirement applies to both competitors and referees);
- during the NSS Disciplines/Classes competitions, the presence of models of other classes should be possibly avoided at the start place (to eliminate radio interference);
- a random check of the model parameters takes place right before the race begins;
- all participants are informed before the beginning of the competition (briefing);
- as this type of competition is intended for the spectators' presence, the spectator zone must be separated from the competitor zone.