

## RULEBOOK Section NS

# 2016



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**For the following classes**

- F - 2 true-to-scale Model ships built from Plans**
- F - 4 Models built from Kits, Ready built Models**
- F - 6 Models for Team manoeuvres**
- F - 7 Models for Individual manoeuvres**
- F - DS Steam-driven Models**
- F - NSS Models of Sailing ships**

**Competition Rules for Radio Controlled Models in the Section NS**  
**(Navigation Scale)**

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## **Competition Rules for Radio Controlled Models in the Section NS**

### **1. Definition of the models**

Radio controlled model ships of the NS section (F-NS) are mobile and floating models, that are controlled by the competitor using radio control equipment. They are true-to-original scale models of ships or boats.

### **2. Model classes**

The section F-NS is divided into the following Model groups and classes:

- Group F2** true-to-original scale model ships built according to technical documentation without using commercially produced parts
- Class F2-A- true-to-original scale models up to a length of 900 mm.
- Class F2-B- true-to-original scale models up to and between the length of 900 and 1400 mm.
- Class F2-C- true-to-original scale models with a length over 1400 mm.
- Group F4** models built from kits that are, or have been, available on the market for at least one year or industrially produced parts, these models must have the general characteristics of a ship, and look as if they are completely finished.
- Class F4-A- models built from kits or industrially produced parts, that have the characteristics of a ship, also commercially built models (RTR Ready to Run, ARTR Almost ready to Run) these models just undergo a steering evaluation.
- Class F4-B-** models that undergo a steering and construction evaluation. Standard model kits. However, the hull, decks and superstructure must be from the kit contents.  
**Explanation see page 42**
- Class F4-C-** models that undergo a steering and construction evaluation. Injected Plastic model kits, that can be, with the use of other materials, improved or changed. However, the hull, decks and superstructure must be from the kit contents.  
**Explanation see page 43**

**Group F6/F7**

Class F6/F7- true-to-original and close-to-original scale models of ships and boats for team manoeuvres (F6) or individual manoeuvres (F7) as well as equipment, if in connection with the types of ship/boats (i.e., floating cranes, drilling rigs, dockyard machines/installations for transferring cargo, suction and bucket ladder dredges, etc.)

**Group F-DS**

Class F-DS- true-to-original and close-to-original scale steam-driven models, with propeller, side paddle or rear paddle wheels. It has to have a fully functional steam engine (of one or more cylinders) or steam turbines. An electrical drive unit for single cylinder and expansion machines to get over the dead point is allowed. The models in this class can either be "scratch build" or bought as a kit.

**Group F-NSS**

true-to-original and close-to-original scale sailing boats in any scale. The true-to-original likeness of the model will be evaluated as part of the construction evaluation.

Class F-NSS-A- Fore-and-aft Bermudan rigged Ships (also flat top modern sails), wishbone gaff rig, without square sails.

Class F-NSS-B- Gaff and lugger rigged Ships (without square rigging).

Class F-NSS-C- Square rigged ships and other types of sails (e.g. Latin sails).

Class F-NSS-D- multi-hull boats and boats with special drives.

**3. General rules and regulations for construction**

- (1) Only models built by competitors or teams are eligible to compete in the F-NS classes. The model must belong to the competitor or team.  
Exception to this Rule: industrially or commercially built models, can compete in the classes F4-A and NSS.
- (1.1) models built from kits that are, or have been, available on the market for at least one year
- (2) There is no limit to the length of the model in the F-NS classes.
- (3) The model must be controlled / steered without cables or wires nor with the help of any internal means, such as: electro-optical, GPS, etc. However, a gyro compass can be used in NSS classes for special functions only (i.e. for

moving internal ballast in dependence on heeling). The use of gyro compass for navigating/steering is prohibited.

- (4) In the F-NS classes, all models undergo a construction evaluation. (with the exception of F4-A)
- (5) In the F-NS classes, the diameter of the boat's/ship's propeller may be enlarged up to 1.5 times and the surface of the rudder a maximum of 2 times the size of the original true to scale size (however, this does not apply to the F-NSS classes). Additional changes and supplements are not allowed (with the exception of F6/F7 and F-NSS classes).
- (6) In the F-NS classes, measuring the length and width of a model in order to place it in its appropriate class, and to determine the size of the measuring rectangle (dock), is carried out the following way: all the parts that protrude over the sides (port and starboard), bow and stern, are included in the measurements but only those parts which are permanently attached.
- (7) The model scale is not limited. The metric and inch systems may be used.
- (8) Parts or groups of parts, which were made by persons other than those stated in the model's certificate, will not be evaluated. These parts are then considered as not being there, and must be stated so in the models certificate. This rule does not apply to the following items : ropes, chains, pipes, profiles, fabrics, etc.
- (9) The model must be presented in a clean state, as if it was a new ship leaving the shipyard.
- (10) Models or parts of the model made from bone or ivory are banned.

#### **4. General rules and regulations for the courses in F-NS classes**

- (1) Competitions in the F-NS classes take place on two different courses:
  - for the classes F2, F4 and F-DS the course is an equilateral triangle (see Figure 2).
  - for the classes in F-NSS there is a special course.
- (2) The competition is to be held on still water, if possible protected from the wind, with the exception of the F-NSS classes.
- (3) For larger competitions in the F-NS classes, more courses may be constructed and placed on the water, so as to achieve a faster and smoother running of the competition. However, the conditions in the starting area and on the water must be similar. Each run/heat of each class has to take place on the same

course. When there is a large number of competitors, it is permitted to allow a maximum of 2 models on the same course at the same time but with a suitable distance difference between starts.

## **5. Required Personnel for the Start Area in the F-NS classes**

The following staff are required on the Landing stage for the F-NS classes:

### **Class F2, F4, and F-DS**

- 1 Start area executive (chief judge)
- 2 timekeepers (judges)
- 1 Goal Judge
- 1 secretary

### **Class F6/F7**

- Judges panel for static evaluation (see 11.2)
- 1 secretary - colleague for order and security

## **6. Minimum requirements for the Start area in the F-NS classes (excluding NSS)**

A Start area is required to be equipped with the following materials and instruments:

For all classes

- 1 starting platform (Landing stage)
- 1 picture/plan of the course
- buoys
- 1 table and 3 chairs
- a well-sheltered place for judges
- 1 board for displaying the results
- 1- 2 rescue boats
- 2 stopwatches
- 3 seconds buzzer

Additional items for F2, F4 and F-DS classes

- 1 evaluation rectangle in the shape of a dock (see Fig. 3)
- 1 ruler with a length of 1000 mm

## **7. General regulations for the start and finish of a Steering evaluation**

- (1) During the contest, a contestant must restrict himself to the clearly marked space on the landing stage. Inside this space his movement is unrestricted.
- (2) After the evaluation, the model must be taken out of water without any delay and the transmitter turned off.

- (3) If the model is out of control during the run, its further participation will be cancelled after one minute (with the exception of NSS classes). The start will be, however, considered as being valid. On courses F2, F4 and F-DS, the points attained prior to the interruption will be counted. If the model or contestant was being hindered during the contest, then he may ask for a rerun at the end of the heat. There is only one rerun allowed, and it is only in the case of interference by other contestants, boats/ships and models. It is up to the start executive/chief judge to plan an other slot.
- (4) If a contestant had to interrupt an evaluation for the above mentioned reasons and the chief judge after investigating the circumstances allows a rerun, the contestant has to complete the whole course again. The points attained during the unfinished run are not counted.
- (5) No one is allowed to touch the model during a steering evaluation.

## **8. Technical and sporting regulations**

### **8.1 Model propulsion and drive units**

- (1) The model propulsion unit in classes F2, F4, F-DS and F-NSS must correspond to the original ship. Classes F6 and F7 are an exception from this rule.
- (2) The allowed types of propulsion are an electric motor, steam engine, combustion engines, turbine or sails.
- (3) In the event of an electric motor, the voltage of the battery may not exceed 42.0 V.
- (4) Additional means for better viewing of the course, such as control by transmitted picture, ultrasound, GPS or other electronic methods, are not permitted

### **8.2 Use and operation of Radio-control equipment and supervision**

- (1) At official NAVIGA events only radio-control equipment whose frequency range does not exceed 20 kHz is permitted. This frequency allows a simultaneous use of 12 models in 27 / 40 MHz band or all channels in other permitted ranges.
- (2) Every transmitter and receiver must be equipped with rapidly interchangeable crystals. Competitors are recommended to have several pairs of crystals in case a frequency change is necessary.
- (3) The use of radio-control equipment is subject to the regulations of the country hosting the NAVIGA event. For this reason the contestants do not have a right



to file a complaint to the organizer. However all the necessary information must be stated completely and unequivocally in the competition invitation.

- (4) A frequency flag or label must be attached to every antenna. In case of crystal change, the flag or label has to be replaced as well.
- (5) The organizer of a competition is recommended to set up a radio control team to detect possible interference from other radio-controlled services or with other radio-control equipment involved in the R/C-class competition. Such control is obligatory for world, continental and European championships. To achieve more safety, the frequency intervals should be set so that in a group no two neighbouring frequencies are used simultaneously.
- (6) If interference, which caused the failure of a model, is detected, the competitor concerned should be given the opportunity for a rerun.

### **8.3. Buoys (dimensions, characteristics, anchoring, NOT valid for NSS classes)**

- (1) The competition course is marked out by buoys. Each buoy must have markings consisting of two colours which must be clearly seen. The colour strips must run vertically to the water surface.
- (2) Buoys must be cylindrical and must protrude at least 100 mm and at the most 200 mm above the water surface. Their anchoring must ensure their upright position and a tolerance of +/- 5% of the width of gates (measured from buoy centre to buoy centre). For F2, F4 and F-DS courses the anchoring of buoys must allow their revolving when touched.
- (3) The buoy's diameter is 100 mm.
- (4) The buoy must be made from a material which is not prone to damage the model when touched (i.e. from Styrofoam, polystyrene, cork, plastic, etc.).
- (5) The connection between the buoys must be at least 300 mm below the water surface. No connection is allowed within the course.

### **8.4. Landing stage (construction and characteristics)**

- (1) Landing stages must be built, taking local conditions into considerations, to provide adequate space for competitors, colleagues, judges and models, to

exclude any obstacles caused by lack of space and to prevent any risk for competitors and models.

- (2) The minimum dimensions of a Landing stage (with the exception of the classes F6/F7) must be: in length (the starting side) a minimum of 4 meters, and the width (towards the shore) a minimum of 1.5 meters.
- (3) The access to the Landing stage, especially the path for transporting the models to the start, must exclude any risks or danger. The surface of a Landing stage must be so constructed as to exclude any risk of slipping or stumbling (even when wet).
- (4) The construction must not move or change its position in any other way when weight is applied. The starting side must not be more than 150 mm above water surface.
- (5) Floating Landing stages can be used if their anchoring and stabilization excludes the movement when weight is applied or in case of waves on the water.

#### **8.5. Use of pyrotechnic products**

- (1) The use of pyrotechnic products at official NAVIGA competitions is subject to the laws and safety requirements of the host country.
- (2) In the invitation to a NAVIGA competition, the organizer must provide exact, unequivocal and complete conditions for import, transport, storage and use of pyrotechnic products.
- (3) The competitor is personally responsible for complying with the safety regulations. The competitor must obey any regulations for the use of pyrotechnic products issued by the organizer.
- (4) The organizer is authorized to prohibit the use of pyrotechnic products if safety regulations are not obeyed. It is not possible to file a protest against this, provided that information on handling of pyrotechnic products was issued as outlined in paragraph (2) above.

#### **8.6. Rules governing the permitted number of models, conditions for participation and state of models in a competition**

- (1) At a world and continental championships, for each national association there is a maximum number of competitors allowed in each class:  
5 competitors plus the title holder per Nation.

- (2) In the classes F2, F4, F-DS and F-NSS, each competitor may only enter the competition with one model per class. Using the same model in class F4-A and F4-B during the same competition is not allowed. With the NSS classes the same model may be used in different classes with different rigging, under one condition, that the original ship was or is also equipped with different rigging.
- (3) In classes F6/F7 the number of models is not limited.
- (4) **To use a model in a different class** during the same competition, the competitor must follow these rules below:
  - a model from the classes F2, F4, F-DS and F-NSS may also take part in the classes F6 and F7
  - a model from the classes F6 or F7 may take part in other classes of the NS section if it meets the rules for these classes.
- (5) Entering a model in more than one class must be declared during the registration.
- (6) Every model must start and finish a competition in the same condition as when it was registered and admitted to the start. If at the start an essential part is missing, aerial for the radio control or is lost during the navigation, no time nor points will be awarded (this doesn't apply to the damage or lost of parts of the NSS models caused by an accident during the competition heat). The decision is under the start area executive's (chief judge) jurisdiction. An exception to this rule are models that have different types of sails in the NSS classes (see par. 2).

### **8.7. Rules governing repeat evaluations (Re-runs)**

- (1) If a competitor's model is damaged during a run or heat in the water, they have no right to a rerun. The same applies if the propeller is obstructed by a foreign object or water plants, etc.
- (2) A re-run may be allowed if:
  - a) the timekeeping is faulty
  - b) if the control of the model was lost as a result of interference which was detected by the radio-control team
  - c) a buoy breaks loose during the evaluation

**8.8. Confirming the participation, eligible Competitors, Setting the starting order**

- (1) After the registration has closed, the supervisory committee will announce the competitors eligible to take part in the competition. This must be openly published (for example, the starting order list) and contain the following data.
  - name of the participants or competitors
  - exact data of the models admitted to the competition, in their respective classes.

The decision for not admitting a participant must be justified.

- (2) The earliest time a competition or races can commence is one hour after the eligible Competitors list was made public.
- (3) The organizer has to ensure that the completed and checked starting order list of competitors is delivered to the Start areas on time.
- (4) The starting order is determined by the organizer.
- (5) If there are two or more start areas, the supervisory committee must announce which channels will be used at the respective start area.
- (6) If a competitor participates in several classes at the same championships and the evaluations take place simultaneously at several start areas, the competitor is not entitled to have the starting time or starting order changed, unless if after checking with the start executive/chief judge the possibility exists to provide him with a new slot. At any case this operation may not interfere with the normal progression of the competition.

**8.9. Calling-up time**

- (1) Call-up time is **1 minute**. During this time the start area executive (chief judge) must call a competitor's name three times to summon them to the starting area.
- (2) If the competitor fails to appear in the designated time, they are then no longer entitled to take part in that evaluation.
- (3) During one competitor starts, the next competitor, according to the starting order, is summoned to the starting area.
- (4) If a competitor fails to appear in the starting area, the call-up time for the next competitor is **2 minutes**.

### **8.10. Preparation time**

- (1) The preparation time begins when the competitor and his model appear on the start area and steps into the preparation area, which should happen without any delay. The beginning of preparation time is determined by the

Start area executive (chief judge) who announces it clearly to the competitor.

- (2) Preparation time relevant for all classes are:
  - a) for models with motor - 2 minutes
  - b) for models in the F6 and F7 classes - 5 minutes
  - c) for models in F-DS class - 15 minutes
  - d) for NSS - 4 minutes
- (3) The progression of the preparation time is to be acoustically and if possible also visually relayed to the competitor, according to the following rules (except NSS classes):
  - with a 2 minute preparation time every 30 seconds
  - with a 5 minute preparation time every full minute
  - with a 15-minute preparation time every fifth minute and then on the 13<sup>th</sup>, 14<sup>th</sup> and 15<sup>th</sup> minute.
- (4) Before the preparation time ends, the model must be in the water and have started its evaluation.
- (5) It is not allowed however to sail into the course during the preparation time. The penalty for doing so is disqualification. Therefore close coordination between the judge and the competitor is required.

### **8.11. Indication to start the evaluation**

- (1) In order to prevent any misunderstanding, the competitor must announce their start of the evaluation to the referees on the starting area by showing a clear signal (raising their hand, calling out, etc.). It is recommended that the competitors and referees agree on a clear signal. After the signal, nobody is allowed to touch the model anymore.
- (2) If during the preparation time the evaluation cannot be started due to a fault on behalf of the competitor, this then constitutes a false start. The competitor receives no score in the results table. Does not apply to the NSS classes.

### **8.12. Interruption of the competition**

- (1) An interruption of the whole competition may only be ordered by the main referee.

- (2) An interruption of a evaluation at a start area may only be ordered by the start area executive (chief judge).
- (3) If the evaluation has been interrupted for more than 60 minutes, the whole evaluation for all competitors has to be repeated.

### **8.13. Evaluation and announcement of results**

- (1) All results obtained during the evaluation must be announced at the starting area, or results from the construction examination committee, immediately either acoustically or optically shown. The acoustic announcement is to be given in one of the official languages of the NAVIGA plus the language of the hosting nation. The acoustic announcement is only a preliminary result.

The results of the construction examination committee are only shown optically and count as the end result.

- (2) The results are entered into the results table. After the evaluation, or after the construction examination, the results are handed over to the computation centre for a check and within one hour they must be openly published by the supervisory committee or by the jury as preliminary results.
- (3) At least one hour after the preliminary results have been openly published, the results should then be proclaimed final and official by the supervisory committee or by the jury and published as final.
- (4) After the results have been proclaimed and published as final by the supervisory committee or by the jury, a protest about these results can no longer be filed.
- (5) Competitors who did not achieve any results, for example: false or late start, not being present at the evaluation etc..., will obtain zero points, and cannot be given a placing. They will be listed at the end of the results list in alphabetical order without any numbering. The same applies to anyone, who did not have a valid start during a steering evaluation. Points attained in the construction examination are irrelevant. The same applies to the F6 and F7 classes if there was no valid start.

### **8.14. Composition of result Table**

The competition results table must contain the following data:

- type and Place of event
- date
- class
- first and last names (or the team name), and country of origin of the competitor, or team
- name and scale of the model

- evaluation of each referee, result of the construction examination
- results of the steering evaluation
- final result
- ranking and placing
- name, country and ID number of the referees
- signatures of the main referee, chief Start area judge and the head of the evaluation committee

## **9. Construction examination of the models**

### **9.1. Rules governing the construction examination**

- (1) Construction examination is held for models in the F-NS classes, with the exception of the F4-A class.
- (2) Construction examination is conducted individually and separately for each respective class. In all the classes, the construction examination is carried out before the steering evaluation.

### **9.2. Technical and Organising Rules for the construction examination**

- (1) For the construction examination, the organizer is required to provide the following:
  - a well-lit area or room, sufficient in size, shaded from the sun and partitioned off from the competitors and visitors with sturdy tables on which the evaluated models can be displayed
  - an area or room for private meetings of the evaluation committee
  - measuring devices for checking the model dimensions
  - sufficient number of evaluation sheets (see supplements).
- (2) The organizer, the supervisory committee, or the jury, together with individual committees are required to ensure sufficient time for careful construction evaluation of the models, taking the number of models into consideration.
- (3) The official score sheets for the construction examination must be kept by the secretary and must be checked and confirmed by the head of the committee. Each class has its own scoring sheet. It must contain the following:
  - first and last names and country of the secretary and the three members of the construction examination committee
  - first and last names and country of origin of the competitor
  - exact description of the model (name and type of original)
  - total number of points awarded to the model by the three referees
  - final result of examination (number of points)

- (4) Each member of the construction examination committee, must have a evaluation sheet (see supplements) to hand.

### **9.3. Scales and construction data**

- (1) The scale is free and up to the competitor to determine.
- (2) The competitor has to submit the model's certificate at registration, and all documents used for the construction of the model at the construction examination.
- (3) To enable whether a "true-to-the-original" construction has been achieved, the following documentation must be presented at the construction examination:
  - a) a scale drawing of the side and top views plus a rib sketch, as well as a cross section-
  - b) total length, width and draft of the original boat/ship.
  - c) originals or copies of all documents, museum documents, shipyard plans, books, magazines, catalogues, as well as other documents and photographs of the boat/ship and its details.
- (4) If the Model builder (competitor) made the plans him/herself, s/he has to attach a list of sources. The Rules in 2 and 3 above still apply, as well as documentation of the original boat/ship.
- (5) If the technical data and details of the original boat/ship in the used source materials (literature, photographs, shipyard plans, etc.) are contradictory, it is up to the competitor to choose one of the possible variations of the original, or documentation from any of the sources. A competitor must not be penalized for his/her choice of source or variation.
- (6) If the competitor implemented later modifications of the original ship which were not included in the original documentation, s/he must provide supporting evidence for them by precise references to there sources.
- (7) If the competitor fails to provide documentation, the model can only be evaluated under the headings of "execution", "impression" and "work content".
- (8) If the documentation is incomplete, points will be deducted under the heading of "accuracy" according to the degree of missing information.

### **9.4. Model evaluation**

- (1) Models are evaluated separately in there respective classes. The models must not obscure the view of one another.



- (2) Each member of the examination panel evaluates each model and notes down points awarded onto the evaluation sheet according to the evaluation criteria (only whole points are awarded). The result of the examination and evaluation of the model is the sum of points awarded according to the respective criteria.
- (3) When in doubt as to what class, or group, a model belongs to, the decision resides with the main referee.
- (4) The construction examination panel carry out a private consultation, under the guidance of the main referee. This consultation is intended to agree on a uniform interpretation of the rules, as well as the approach in case of doubt. In case of a discrepancy the main referee has the final word.
- (5) Careful attention must be paid while measuring the models, so as to prevent possible damage.
- (6) After the consultation, the examination panel evaluates the models in there respective classes and looks over all of the models that are to be evaluated.
- (7) Each judge evaluates the models on his own and independently to the other members of the panel, the evaluation is based on the specific criteria for the individual classes.
- (8) When all the members of the panel have finished their evaluation, the secretary writes down the points of each member in the score sheets (see supplements).
- (9) If the total points awarded to a model are between 70–100 and there is a difference of more than 5 points between the highest and lowest points awarded, a private consultation will be held.
- (10) During this consultation the members of the construction examining panel with the highest differences must justify their assessment.
- (11) Based on the present results for the concerned model and taking into account the discussions and views expressed during the consultation, the head of the examination panel proposes an average of the total points for the concerned model. A vote is carried out to agree on the points awarded.
- (12) The judges, who awarded an extreme difference in points, must repeat the evaluation of the concerned model again and remain within a **2** point tolerance higher or lower from the agreed total average.

- (13) To calculate the final points awarded for a particular model, the points given by the three judges are totalled and then divided by three to give an average, this is then the Total points awarded. The secretary immediately writes down the points achieved in the score sheet.
- (14) All visible parts of the model are subject to the evaluation. Additions to a model kit are to be evaluated positively.
- (15) The examination panel can if they choose, put all comparable models next to one each other in order to aid in their evaluation.
- (16) The competitor should be present at the construction examination. The members of the examination panel may ask the competitor questions regarding the model and construction documentation.
- (17) The competitor is obliged to tell the examination panel before the evaluation starts, which parts of the model were not constructed by him/her.

**9.5. Judges panel**

The Judges panel for the construction examination consists of:

- 1 main referee
- 2 referees
- 1 secretary (non voting)

**10. Running a Competition in classes F2 and F4**

**10.1. Construction examination** of models in classes F2, F4-B, F4-C and F-DS

- (1) The following criteria is essential for the evaluation of the models:

Craftsmanship ..... max. 50 points  
 Evaluation of technical craftsmanship and quality of the model.  
 Accuracy of the forms, the look of the surfaces and the quality of painting.

Impression.....max. 10 points  
 Evaluation of the overall impression and the appearance of the model.

Extent ..... max 20 points  
 Evaluation of the overall extent of work on the model. Reconstruction and improvements should be evaluated positively. Time-consuming work should be considered and assessed, based on the degree of difficulty. In the F4-B and F4-C classes, reconstruction and accessories should be considered.

Accuracy in relation to the construction documents..... max. 20 points

Evaluating the construction scale (considering allowed tolerances). Completeness of all details, based on the documentation used by the competitor. Evaluation of the correct choice of paint and natural appearance of wood, metal, fabric, rigging, etc.

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

Length of the model up to:

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

Width of the model up to:

50 mm	150 mm	300 mm	600 mm	wider
+/- 2 mm	+/- 3 mm	+/- 4 mm	+/- 5 mm	+/- 6.5 mm

## **10.2. Running the Competition**

- (1) The triangle with buoys must be set up as an equilateral triangle based on Fig. 2. A possible variant to this is: Point **S** is the centre of the triangle. To set the buoys out exactly, the straight lines **A-S**, **B-S**, **C-S**, when viewed from the bank, must intersect in point **S**. When extended, the lines must cross the centre of the start gate, or through the buoys in the corners of the triangle.
- (2) The competition consists of three separate runs/heats. Competitors must take part in all the runs/heats.
- (3) The steering test takes place on a slalom course (see Fig. 2). The competitor must steer his/her model through the course gates in the order prescribed. The course has a total of 12 gates, 11 forward and 1 reverse.

Order of gates	Points per crossing	points deducted for touched buoy
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 manoeuvre	10	-5
Total	100	

- (4) The evaluation heat must be completed in a maximum of 7 minutes, including the docking manoeuvre. After 7 minutes the model must return to the starting point by the shortest route and it must be taken out of water. The competitor is informed about the time elapsed every minute. Only the points scored within the set time limit, constitute the model's score.
- (5) Only one attempt may be made in a permanent forward movement when approaching any gate, except for the gate to be taken in a backward movement.
- (6) A gate is considered passed if the model crosses the base line between the two buoys, every gate that is crossed correctly or not, the Start Judge must declare the points given in English, according to the above Table.
- (7) If the buoys turn visibly, or pushed away side wards, it is considered the model has touched the buoys. If the model touches both buoys while passing through the gate, it is considered as one touch.
- (8) A missed gate is considered when the model crosses the extended base line outside the gate that has to be driven through. All points for the respective gate are deducted.
- (9) If the model does not pass through the gates in the order prescribed, it is considered that these gates have been missed. Every gate must be started in the right order, if not, the all following gates and dock are not evaluated.
- (10) The top gate (no. IV) must be passed twice in the prescribed order. For each correct pass, the competitor scores 6 points respectively. For each touch, the competitor loses 2 points. If the model touches both buoys during one pass, it is considered as one touch.

- (11) The last gate should be navigated through in a permanent backward movement. By a touch free thoroughfare of the gate you obtain 12 points. By missing the gate, or if the stern of the ship leaves the baseline between the 2 buoys in a forward movement after entry 12 points are deducted. With a buoy touch 4 points will be deducted.
- (12) After passing through the last gate, the model must perform the docking and stopping manoeuvre within the measuring rectangle. During this manoeuvre, the competitor must not be influenced by any calls or signals.
- (13) The measuring rectangle is set up in the form of a dock (for possible variant see Fig. 3) and must be covered, on both sides, with soft material to protect the model. Measuring rectangles and a stop pole are marked out on the dock at both ends; the stop pole, which is at a right angle with the dock and which must be mobile, determines the width of the measuring rectangle.
- (14) For the length of the measuring distance with the stop manoeuvre **are valid for all classes regardless of the length of the model: 500 mm**
- (15) The width of the dock for F2, F4 and F-DS classes is determined according to the following formula:  
Model width (in mm) + **200 mm** = the width of the dock (in mm)
- (16) It is the competitor's choice whether he enters the dock from the right or left hand side.
- (17) The head judge of the start area must be on the landing stage during the docking manoeuvre and should check to see whether the model stops within the measuring rectangle.
- (18) The measuring rectangle may only be entered once. Leaving the measuring rectangle to repeat the docking manoeuvre is not permitted and gets zero points. Multiple manoeuvres to enter the Dock without touching the sides and entering the measuring rectangle are permitted.
- (19) A perfect docking manoeuvre, taking 3 seconds, scores 10 points. This means that the model did not touch the sides of the measuring rectangle or the stop pole. Before entering the measuring rectangle, the model must not touch the sides of the dock. The Model must be brought to a halt with its bow in the measuring rectangle determined by the relevant class.
- (20) When the model is stationary, the competitor must call out "stop" in a loud voice, raise his arms, and stop using the radio control equipment. A referee must check that the model remains stationary for 3 seconds; this period of time is determined by a stopwatch or acoustic signal.

- (21) 5 points are deducted if one of the following mistakes took place during the docking manoeuvre:
- a) the model touches a wall of the dock inside or outside,
  - b) the model did not remain still for 3 seconds (acts of nature are to be considered by the judge),
  - c) the competitor failed to call out "stop" and raise his arms,
  - d) after calling out "stop", the competitor used the radio control equipment.
- If two or more of the above mistakes occur, the docking manoeuvre is regarded as failed and 10 points are deducted.
- (22) The docking manoeuvre is also considered failed and 10 points are deducted if one of the following mistakes occur:
- a) after entering the measuring rectangle, the bow of the model leaves it again,
  - b) the model touched both sides of the dock,
  - c) the model touches the stop pole.
- (23) If the technical and organizational conditions allow, there may be more models on the course at any time, however the maximum is 2.

### **10.3. Scoring**

- (1) The final score is achieved by adding the points attained during construction examination and the steering test. The steering test score is the average number of points attained from the best two runs/heats.
  - (2) By equality of points a new result will be calculated by taking into account the other runs.
  - (3) If two or more contestors obtain the same amount of points then the first reruns will take place by navigating the triangle in the opposite direction, being gates 1 , 5 , 6 , etc. When after this there is still no final place decision, is it then up to the start area executive ( chief judge ) and the main referee to decide on a special course. In any case all contestors should be informed of the defined course.
-

## **11. Running a Competition in the classes F6/F7**

- (1) The competition consists of a sight and a show assessment, which is divided into two heats. The sight assessment takes place before the first show assessment.
- (2) Models allowed are true-to-original or close-to-original replicas of ships and boats, as well as equipment, closely connected to the types of ships/boats (i.e., drilling rigs, floating cranes, dockyard machines/installations for transferring cargo). For length and surface area of the models see §3.(2)

### **11.1 Evaluation rules**

- (1) During the sight assessment, model functions are shown according to the presented program, and are discussed with the competitors. Also the quality of the model will be evaluated.
- (2) Every member of the Judges panel evaluating the model functions award points at their own discretion, independently of others. Discussions between the panel members are not allowed.
- (3) Individual functions must be presented in the order that are listed in the program. If the functions are not presented in the correct order, they will not be evaluated, neither will the functions immediately influenced by that function.
- (4) After the show assessment in these classes, the Judges panel meets for a private discussion.
- (5) The result of the first heat is publicized on an information board. Final results will be announced after the second heat.
- (6) No protests are allowed against the ruling of the Judges panel.

### **11.2. Judges panel evaluating the model functions**

The sight and show assessment are evaluated by a Judges panel consisting of the following:

- 1 head of the panel (chief judge)
- 2 referees
- 1 secretary

### **11.3. Running the competition**

Terms and conditions for the show assessment:

- (1) Shows from or towards the Start area (bank) are only evaluated if they are performed by the models themselves. Functions performed from or on the start area (bank) will not be evaluated.
- (2) The show must be relevant to the historical period, scale and sailor's customs.
- (3) Pyrotechnic products are included in the evaluation only if they agree with the type of the ship/boat and action performed. The electronic equipment used for detonating the pyrotechnics must be able to be disconnected from its power source, and can only be turned on at the start of the preparation period. The use of pyrotechnic products is subject to the laws and safety requirements of the host country. Disobeying the laws is punished by disqualification.
- (4) For the show there must be a big enough landing stage available (min. of 6 x 1.5 m). The show should take place in a place which enables the Judges panel a good view of the functions performed.
- (5) The competitors and teams can choose the form and way of performance/show from the terms described in paragraphs (1) to (4). At registration they have to provide **four** copies of the programme, in one of the official NAVIGA languages. The text must be composed in such a way that the meaning and the content of the program are understandable. The program can be compiled with course and function sketches. The competitors do not have any right to claim these programmes back.

#### **11.4. Evaluation criteria**

- (1) Model craftsmanship ..... max. 30 points  
Evaluating the quality of the model.
- (2) Quality of the program
  - (2.1) Performance/Show ..... max. 30 points  
Comparison of the presented and realized programme. The order of performed functions and order of manoeuvres. Total impression of the performance.
  - (2.2) Impression ..... max. 20 points  
Creativity of the show/performance and individual functions related to the model and type of ship/boat. Creativity of the performed programme related to the content (manoeuvres, running in a formation, supplying at sea, rescue actions, sea battles, etc.). Creativity of individual functions, which are not directly related to the ship/boat type.



- (2.3) Extent/Range ..... max. 20 points  
This means the complexity of performed functions and their smooth transition, as well as the range of performed functions and their realizations.

### **11.5 Running the contest**

- (1) There are two heats, which must be separated by sufficient time so that both heats can be technically prepared.
- (2) The competitors have a maximum of 15 minutes to perform their program. There are 5 minutes allotted for preparation, which is not included in the 15 minutes. The second heat is not mandatory.
- (3) In the class F6 (team's manoeuvre) several competitors, **maximum 5 starters**, with several models start at the same time. In the class F7 (single manoeuvre) a competitor can bring forward one or several models.
- (4) Competitors and their helpers bring their models to the start area and leave them there. They must not put them on the water. Equipment necessary for the show, such as shore-side constructions, boat piers, etc. may be set on the water and attached to the landing stage before the preparation time begins.
- (5) After a clear hand signal from the leader of the team (F6) or the competitor (F7), the chief judge of the Judges panel announces the beginning of the preparation time. After that the transmitters may be turned on. The remaining preparation time must be announced after every full minute.
- (6) After the beginning of the preparation time is announced, the models may be placed on the water. The show/performance must start during the preparation time. If the show/performance does not start during the preparation time, the start is interrupted and cancelled and no score is achieved. The competitor or the leader of the team must give a clear hand signal to the Judges panel signalling the start of the show/performance. After this signal is given no one is allowed to handle the models. If the models are handled, they will be omitted from the show/performance. The helpers must leave the landing stage when the show/performance starts.
- (7) After 15 minutes has elapsed (from the end of the preparation time), the show/performance is stopped by the Judges panel, the functions performed up until this time are then evaluated.
- (8) The models must immediately be taken out of the water, the transmitters must be turned off and the landing stage cleared.

## **11.6 Scoring**

- (1) Junior and senior competitors are evaluated separately. In the F6 class (team manoeuvres), if there are both age groups in one team, the team is considered to be senior and will be evaluated so.
  - (2) The better heat of the two will count for the scoring.
  - (3) To achieve a result of the show/performance, the points given by the three Judges is averaged out. This is the result for the show/performance
  - (4) The secretary of the Judges panel enters the final result into the results sheet.
  - (5) The medals will be distributed according to the attained number of points in the absolute order.
  - (6) There is a title of champion. In the case of a tie, the corresponding ranking will be awarded multiple times – the rankings immediately after are then not awarded.
- 

## **12. Running a Competition in classes DS**

True-to-original and close-to-original steam-driven models which can be “scratch build” or kit, with propeller drive, side paddle or rear paddle wheels. The model has to have a fully functional steam engine (of one or more cylinders) or steam turbines.

An electrical drive unit for single cylinder and expansion machines to get over the dead point is allowed.

### **12.1 Judges panel**

The Judges panel consists of:

1 head of the panel (chief judge)

2 referees

1 secretary of the panel. The secretary has no right to vote.

### **12.2 Running the Competition**

**A** – construction evaluation (of the ship/boat and drive unit)

**B** – steering test

**12.2.1 Static evaluation criteria**

(1) The ship/boat as in F2 / F4

Craftsmanship	max. 50 points
Impression	max. 10 points
Extent	max. 20 points
Accuracy in relation to the construction documents	max. 20 points

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 max. 100 points

(2) Drive unit

**Evaluation criteria of the machinery**

<b>Engine</b>	40 points
<b>Boiler</b>	30 points
<b>Auxiliary equipment</b>	20 points
<b>General impression</b>	<u>10 points</u>
<b>Total maximum points:</b>	100 points

**Details****1. Engine**

Self made:	multicylinder slide or piston valve engine	40 points
	multicylinder oscilating engine	35 points
Kit:	multicylinder slide or piston valve engine	35 points
	multicylinder oscilating engine	33 points
Bought engine:	multicylinder slide or piston valve engine	32 points
	multicylinder oscilating engine	30 points
<u>Remark: if no constructionplans,</u>		<u>minus 10 points.</u>

**2. Boiler**

Self made:	30 points
Kit:	27 points
Bought boiler:	25 points

**3. Auxiliary equipment.**

Self made:	20 points
Kit:	18 points
finished parts:	16 points

**4. General impression:**

10 points

At the registration, the technical certificate must contain a clear systematic

A diagram depicting the connection of the steam engine, boiler and all of its auxiliaries will be provided.

Competitors must submit a safety certificate of the engine or a written statement attached to the technical certificate. (see above specimen)

**Statement specimen:**

I, (name, address), hereby declare that the steam engine in my model (name, length, width, weight, details from the technical certificate) meet the EU standards. I declare that both the boiler and the fuel supply were constructed according to the technical regulations and was tested for safety.

I agree to abide by the safety rules defined of the NAVIGA rules, section NS.  
Date, place, signature.

The area for preparation and heating up the boiler must be closed for spectators. Only allocated frequencies shall be used.

**12.2.2 Steering evaluation criteria**

The same rules apply as for F2 and F4 classes.

The competitors go through 3 runs/heats; there is a maximum of 15 minutes for each run/heat.

By equality of points the average of the two best runs will be taken into account, the remaining run will be added to this average in case of equality.

**12.2.3 Summary**

1. Construction evaluation
2. Steering evaluation

Steering evaluation	max. <b>100</b> points
Construction evaluation ( boat & engine ) 2x 100 points	max. 200 points

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max. **300** points



## **13. Navigation Scale Sail F-NSS**

### **13.1 Classes according to the rigging**

**NSS - A** Fore-and-aft Bermudan rigged ships (also ships with flat top sails), ships with Wishbone Gaff rigging (without square sails)

**NSS - B** Fore-and-aft gaff or lugger rigged ships (without square sails)

**NSS - C** Ships with square sails and other types of sails (e.g. Latin sails)

**NSS - D** multi-hull boats and boats with special drives

The number of masts and the method of distribution of the total sail area (e.g. sloop, cutter, yawl, schooner, etc.) are not limited and they are irrelevant for the purposes of placing the boats into a class. Models of boats and ships with rotating cylinders or solid airfoils instead of sails belong in the class NSS-D.

The division into the above mentioned classes depends exclusively on the efficiency of the rigging. The achievement criterion is the so-called way windward. For ships with mixed sails the allocation is according to a less efficient sail. Thus e.g. a schooner with a gaff schooner foresail and a Bermudan mainsail will be assigned to the class NSS-B, a gaff cutter with one single square sail will be assigned to the class NSS-C.

### **13.2 Static evaluation**

#### **13.2.1 General Rules**

The contestant is required to present documentation of the original vessel, which clearly shows the main dimensions of the original vessel (i.e. total length and width of the hull, length of the waterline, length of bowsprit and stern bumkin respectively, height of the mast or masts, draught, size and shape of the supplementary centre-board and its place, the sail area and displacement), the lines plan, the plan of the deck with the arrangement of details and attachments, and a sail plan, including details. A plan of the model may be considered as documentation of the original, provided that the plan is supplemented with sufficient documentation to verify its correctness (this may include documentation for a similar ship from the same time period and geographical area – the similarity and geographical relation however must both be proven). The building instruction booklet for kits does not count as documentation.

The model will be presented to the construction examination committee, with its sails set, in a sailing condition, where the sails set are the maximum (according to the “model certificate NSS”) amount of sail area. If it is planned

to change the light wind sails for the smaller storm sails, then these must also be presented to the examination committee for consideration.

**13.2.2 Scoring**

A committee of three members evaluates the models according to the rules corresponding to the general rules of NS section, or otherwise the general rules for the NSS section. The total number of points for models built from scratch, according to plans is 100, for models built from commercially produced kits is 80 (maximum). The distribution of points is as follows:

**Models Built from scratch:**

Craftsmanship ..... max. 30 points  
for the hull, including superstructure, attachments and details (relevant only to above the waterline)

Accuracy ..... max. 30 points  
for accuracy of the model according to the presented documentation

Rigging ..... max. 30 points  
for the craftsmanship and accuracy of the Rigging

Overall impression ..... max. 10 points

**Commercially produced Model kits**

Craftsmanship ..... max. 25 points  
for the hull, including superstructure, attachments and details (relevant only to above the water line)

Accuracy ..... max. 25 points  
for accuracy of the model according to the presented documentation

Rigging ..... max. 25 points  
for the craftsmanship and accuracy of the Rigging

Overall impression ..... max. 5 points

In the examination paragraphs "Craftsmanship" and "Rigging" the points awarded by the examination panel are purely for the workmanship applied to the model (the cleanliness of the workmanship, the grade of details, the correct proportions etc.). A bonus for the (speculated) degree of difficulty, or the fact, that the model was built by a junior, should not be awarded.

If the presented documentation does not meet with the requirements described in paragraph 13.2.1, then there should be points deducted under the paragraph "Accuracy".

The examination committee is bound to carry out the construction examination in a differentiated way according to the above mentioned criteria. Points for the different criteria must be given separately. A detailed table of the results of the construction examination must be posted in English on the notice board one hour before the first race at the latest. The arithmetic average of the total number of points that has been calculated on the basis of the examination of the individual members of the committee will be rounded off to two decimal places.

If a model achieves only 10 points or less in two of the main criteria of the examination (Hull, Accuracy, Rigging), it will be categorized as non-scale and excluded from the following competition.

### **13.2.3. Allowed deviations from the original**

There will be no points deducted during the models examination for the following deviations from the Original.

- (1) Bigger draught – up to 150 percent in class A and B, up to 200 percent in class C, or up to 120 percent in class D (100 percent = draught of the original, calculated according to the chosen scale). For boats/ships with additional centreboards, 100 percent is the draught while the additional centreboard is retracted. When extended, the additional centreboard itself may exceed the maximum allowed draught, if it is operated by Radio control and if its area, shape, and position copy the original exactly. Models with centreboards as only keels are considered as fixed keels and may be constructed as such. The limitations and regulations for additional centreboards do not apply to these boats/ships. The draught may be increased by supplementary keels or an extension of the deadwood (changing the side silhouette of the hull, under the water line). The minimum allowed thickness of the supplementary keel, or the extended part of the deadwood is 5 percent of the maximum width of the hull. The minimum allowed thickness of the additional centreboard is 1/3 of the minimum allowed thickness of the supplementary keel or extended part of the deadwood.
- (2) Supplementary external ballast (so-called lead bomb) is allowed.
- (3) The rudder area may be enlarged without any restriction, while respecting the maximum allowed draught.
- (4) Sheet tackles may be omitted. Sheets may be hung directly on the booms or on the clew of the sail by means of a karabiner or metal hook.

- (5) Jib may be attached to boom.
- (6) The receiver antenna may be attached to the rigging.
- (7) The interior furnishings of the model may be omitted.
- (8) Fenders on the tip of bowsprit or on the stem are allowed.

#### **13.2.4 Definition of a Model Kit**

- (1) This is described as a model kit that is industrially produced, serially made, which contains several prefabricated assemblies and parts (e.g. hull, deck, keel, mast etc.) and is or has been available on the market. Also a self-made exact copy of a kit (e.g. the copying of an industrially made hull), if there has not been a 5-percent change in at least one of the main dimensions (length, width), is classed as a model kit. The 100% dimensions are those of the original industrially produced model kits hull.
- (2) The use of an industrially produced hull and the changing thereof, so that in principal a completely different model is made, compared to the intended model that the manufacturer designed, is classed as self-built, using commercially produced parts. Taking into consideration the listed changes according to paragraph (1) that a minimum of one of the main dimensions of the original is changed.
- (3) The use and fitting out of a small series produced hull is classed as self-built, so long as none of the industrially produced hulls according to the original and / or the measurements (see paragraph (1)) are identical. If the hull is found to be identical with a small series produced hull then the regulations under paragraph (1) and (2) are applied.
- (4) For the use of a ready built hull, points will not be deducted during the construction evaluation according to paragraph (8) of the General rules and regulations for construction.

### **13.3 Running a Competition**

#### **13.3.1 Regatta course**

In the practical part of the contest the boats/ships will take part in a group race (regatta). The course is determined by the organizer of the contest, and has to be laid out so that the start of the regatta is into the wind. The course may be either a traditional triangle or so-called walking regatta (i.e. sailing around an



island during which the contestants control the boats/ships while walking along the shore/bank). The course is laid out in such a way that it includes all the tacks with regards to the wind direction.

The course must be laid out in immediate proximity of the shore, so that the staff of the starting area as well as the competitors will be able to take the bearing of a direction along the starting line, regardless of the wind direction.

The minimum side lengths of a traditional triangle course are 60, 40 and 40 meters. From these minimum lengths, according to the amount of models competing in the regatta, the dimensions have to be increased. The length of the starting line in metres must be at least double the amount of models starting at the same time. Furthermore the longest side of the triangle course must be at least three times the length of the starting line.

The course is marked with buoys, which are anchored with the help of two weights. The anchoring is to be carried out in such a way that a large weight is on the bed of the lake and the second smaller weight is roughly half way between the surface and the bed of the lake. Both weights are connected to each other with some type of line that runs through a loop fixed to the bottom of the buoy. The buoys must be cylindrical in shape and have a diameter of at least 300mm, and stand proud at least 400mm from the surface of the water. Alternatively, the buoys can also be spherical in shape and have a diameter of at least 400mm. The buoys must be made out of a material that when touched no damage can be caused to the models. For good visibility they should be covered in bright luminous colours. They should also be two-coloured with vertical strips so as to aid recognition if a buoy is touched.

### **13.3.2 Course of the competition**

The minimum amount of models to start a race is three. It is advised that the maximum amount of models to start at the same time in a group be limited to 20. If there is more than 20 starters in one class, these can be split over a number of groups, the division into those groups has to be decided by drawing lots. When there are only a few competitors in one or more of the classes, then a collective start of these classes NSS-A, NSS-B and NSS-C is possible, if necessary, however there will be a separate evaluation by classes. The same sort of method can also be used if there is a lack of Junior or Senior competitors. Models in the NSS-D class are not to start at the same time with any of the other NSS classes.

During international competitions and championships the communication in the Starting area is to be carried out in English.

The competitors must be present in the starting area at least 15 minutes before the planned beginning of the regatta. At least 5 minutes before the preparation time is due to start, the landing stage executive must inform the

competitors about the starting direction, how the course is to be sailed, and confirms the starting time.

Before the start the landing stage executive of the starting area announces the 4 minute preparation time. The count down of the preparation time is announced every minute. Immediately after the expiry of the preparation time the 1-minute countdown for the start is announced. The countdown must contain the following announcements: 1 minute to start, 40 seconds, 20 seconds, 10, 9, 8, ... 3, 2, 1, start! During this starting minute, the models must not cross or touch the starting line or its extended parts.

With international competitions and championships all of the announcements e.g. preparation time and the start countdown come from a so-called start tape and are announced in the English language.

The models wait for the group start behind the start line, which is formed by two buoys. The start signal is given by the start tape or by the stage landing executive after the countdown. An early start (i.e. crossing or touching the start line during the 1-minute countdown) is penalised with a penalty circle (i.e. a rotation of the model around an imaginary 360° circle on the water surface) the penalty circle must be completed after the start signal and in the first circumnavigation of the course (see point 13.3.4). After the start signal all models have to cross the start line between both buoys.

The time required to complete the course is recorded for every model on two parallel running stopwatches. A time window of 1 hour is planned for one heat, with a tolerance of +10 minutes. The amount of circuits that have to be completed on the triangular course is acquired by the amount of time required to complete the first circuit. According to the amount of competitors, the amount of circuits that have to be completed is taken from the time the 5<sup>th</sup> model (with 8 or more competitors) or the 3<sup>rd</sup> model (when there is less than 8 competitors) takes to complete a circuit. Additionally, another 10 minutes have to be calculated as reserve.

**Example:**

*12 Competitors, the fifth model completed the first circuit in 5 minutes and 54 seconds (which would be 5,9 minutes):*

$$\text{Circuits} = \frac{\text{Time window} - \text{Re serve}}{\text{time taken}} = \frac{60-10}{5,9} = 8,47 \approx 8$$

*this heat has 8 circuits to be completed.*

The number of circuits has always to be rounded down (e.g. 8, 9 to 8).

As soon as the decisive model has crossed the start line, the amount of circuits to be completed is to be calculated and announced by the Judges. If more

than one class start simultaneously, the amount of circuits to be completed for each of the classes is to be calculated separately, according to the number of competitors in that class.

When crossing the Start – Finish line or when passing the landing stage, each competitor must call out their pre- assigned start number. The judges team must tell each competitor individually, when they have started the last circuit, and the run up to the finish line.

Those competitors who do not manage to complete the required number of circuits in the required time window, will not be evaluated in this heat, and their heat will be discarded. However, the landing stage executive can extend the time window for up to 10 minutes, in particular if additional models can reach the full number of circuits required. Recalculating the time for those competitors who did not manage to complete the race (so that they would achieve the full number of circuits) is not allowed.

### 13.3.3 Scoring

To be able to objectively compare the boats of different performances, a rating is calculated for every model based on the main parameters of the ship construction. The rating formula (Rlog) is defined as followed:

$$R = \frac{L_{WL} * \sqrt{S}}{K * \sqrt[3]{V}}$$

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

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

$L_{WL}$  = loaded waterline length [mm]

$S$  = sail area [m<sup>2</sup>]

$V$  = displacement [kg]

$K$  = chosen constant ( $K = 456$ )

Each boat/ship has its own rating (Rlog) which is multiplied by the time achieved during the regatta race. The evaluation time that has been calculated in that way decides the placing.

$$T_z = T * Rlog$$

$T$  = acquired time [s]

$T_z$  = evaluation time [s]

The model that achieves the shortest (best) evaluation time wins that race and gets 50 points. The respective number of points the following contestants get is calculated as follows:

$$P_n = \frac{T_{z_1}}{T_{zn}} * 50$$

$P_n$  = number of points of the nth model

$T_{z_1}$  = evaluation time of the winner

$T_{zn}$  = evaluation time of the nth model

*Example:*

*3 models finish a race with an evaluation time of 1000, 1200 and 2000 seconds respectively. The winner of that race is the model that achieved 1000 seconds and gets 50 points. The number of points the two other models get is calculated as follows:*

$$P_2 = \frac{T_{z_1}}{T_{z_2}} * 50 = \frac{1000}{1200} * 50 = 41,67 \text{ points for the second model}$$

$$P_3 = \frac{T_{z_1}}{T_{z_3}} * 50 = \frac{1000}{2000} * 50 = 25 \text{ points for the third model.}$$

The calculated number of points has to be rounded off to two decimal places.

The total evaluation of the contest is based on at least 3 regatta heats on the triangular course, where the worst number of points achieved is discarded. The remaining two better numbers of points will then be added to the number of points achieved in the construction evaluation to a final sum of points. The highest sum of points wins.

If two or more models achieve an identical sum of points, then the number of points in the discarded race decides who wins, if there is still an identical number of points, then the number of points gained in the construction evaluation decides who wins. If the number of points of the contestants is still the same, then the decision is taken by drawing lots.

#### **13.3.4 Rules concerning right of way**

- (1) Boat contacts are to be avoided.
- (2) When passing a buoy or immovable obstacle (i.e. bank, pontoon) within 5m range of the buoy or obstacle, the inside model has the right of way before the outside model.

- (3) Provided that two boats are not overlapping, the lee boat has right of way before the windward boat. If there is an overlapping, rule (1) applies. An overlapping occurs, when two boats are on a parallel course, the foremost point of one boat lies before the rearmost point of the other boat in the sailing direction and at the same time the lateral distance of the boats is so small that a course change towards the other boat would entail a boat contact.
- (4) A boat sailing on port has the right of way before one on starboard sailing boat. With fore-and-aft rigged ships the position of the main sail is the determining factor, and for square rigged ships the position of the mizen.

In order to prevent any damage to the models, the right of way rules are to be followed, using this corresponding order.

Obeying the right of way rules is supervised by one or several judges. The boat which offends against the right of way rules or touches / misses a turning marker will be penalised with a penalty circle (i.e. it must drive a circle of 360°). The penalty circle must be carried out in the same circuit in which the model was penalised. The penalised competitor must make sure that they do not hinder any other model while the penalty circle is being performed, this must also be announced to one of the judges. The judge makes sure that the penalty circle is carried out correctly and must announce that the penalised competitor has done so. The model that is completing its penalty circle, has to give way to any other model. If the competitor repeatedly offends or is proved to deliberately offend against the right of way rules, s/he can be disqualified by the landing stage executive.

Impedances and offences against the right of way rules can be regulated if necessary through protests. Protests during a regatta must be regulated by one of the judges immediately and unmistakably.

### **13.4 General Rules**

- (1) The rules for the NSS classes are only valid in the English language version. Translations into any other national language are only accepted for information purposes.
- (2) Models in the NSS classes are only permitted to use the "model certificate NSS". All other variations of the certificate are not permitted. The "model certificate NSS" has to be filled in completely and handed in for the static evaluation. For all data contained evidence must be furnished by the documentation of the model.
- (3) The results are to be displayed in the form of a table at the latest 1 hour before the beginning of the next regatta (heat). The table must contain the following information: name of the competitor, name of the model, racing frequency (assigned canal number), loaded waterline length, sail area, displacement,

rating  $R_{log}$ , static evaluation (points), evaluation times, numbers of points and placing achieved during the regattas (heats), total number of points, total placing. With international competitions and championships the results must be written in the English language.

- (4) For the models of the NSS Classes, the only allowed propulsion system is sails, even if the original boat/ship had auxiliary motors. If the model has such a drive unit, it must be disabled by the competitor in such a manner that it can easily be verified (e.g. by removing the propeller or by fouling up the outlet on a jet nozzle). Disconnecting the engine from the receiver or its power source or simply turning off the appropriate switch is not considered as a clear and easily verifiable disabling of the supplementary motor.
- (5) Movable ballast that contradicts the original ship/boat is not allowed. The whole ballast must be installed in the model firmly, the weight of the ballast and also the position of the ballast may not be changed during a competition. With models whose originals were equipped with movable ballast, movable ballast is allowed. The movement of such ballast on such models may only take place width wise.
- (6) The models sails must be made out of materials that are optically authentic and true-to-scale. Nevertheless, cotton or linen may be replaced by polyamide or polyester material (i.e. cloth used for kites). Sails made of plastic foils are only allowed on models whose original also used sails made of plastic foils and whose documentation proves the usage and the appearance of those unmistakably. A model which does not fulfil the criteria of the optical accuracy of the original sails receives 0.0 points in the static evaluation under the subheading of "rigging". The optical authenticity of the sails also includes their geometrical shape which must not be changed compared to the original (e.g. in order to gain an advantage when the model is measured).
- (7) The model must participate in the regattas in the same condition as it was presented during the static evaluation. Only the sail area may be altered to take into account the force of the wind. Reefing of the sails or removing the sails or exchanging the sails for smaller ones, is allowed so long as the original boat/ship would permit so. Only the sails that were shown during the static evaluation can be used if you wish to exchange the sails. Another possibility is the sealing of a model according to point (22).  
If a part of the model is damaged or lost by an accident during the competition, or if the model has to be repaired because of such an accident, the model is allowed to continue in the competition without any loss of points.
- (8) The calculation of the rating is based on the maximum scale sail area, weight of the ready to sail model (displacement = weight) and the true length of the waterline (loaded waterline length). The areas of the foresails are substituted

with the area of the fore triangle. The fore triangle is defined by the following points: (1) intersection of the luff of the foremost foresail with deck (or with stem or bowsprit respectively), (2) intersection of the same line with the front edge of the mast or the topmast, (3) middle of the main boom gooseneck (hinge) projected horizontally to the front edge of the mast (with boom-less mainsails and with boom-less schooner foresails the projection of the sail throat is used). With sails with rounded leeches this curvature is neglected in the calculation of the sail area (the corners are connected with straight lines and the surface of this geometrical form is calculated). The part of the sail area which overlaps another sail or the fore triangle is not taken into the equation. Flat top sails have to be calculated as an quadrilateral (similar to gaff sails).

- (9) The sail area of a spinnaker (if existent) is not calculated.
- (10) There is no deduction of the sail area of the square sails for models in the NSS-C class, even if the square sails overlap each other or any other sail including the fore triangle.
- (11) The allowed incensement of draught as described in chapter 13.2.3 refers to the CWL (construction waterline). The loaded (real) waterline may lie above the CWL, but never below the CWL. The minimum weight of a model ready to sail may not be lower than the theoretical displacement of the model.
- (12) The weather conditions required for starting a regatta should be a wind force up to and including 4 Bft. Also during the regatta the wind force may not reach or exceed the value of 4.5 Bft. **6,5m/s**. In such cases the regatta must be interrupted and repeated when the weather conditions permit. If within the first 25 minutes of a regatta the amount of circuits can not be calculated according to paragraph 13.3.2, because there is a lack of wind, then the regatta is interrupted and repeated. Also if a sudden weather change happens during a regatta, and given the 10 minute lengthening of the regatta, no models could finish with the agreed amount of circuits, such a regatta is cancelled and repeated.
- (13) Each competitor is required to have at least 3 pairs of crystals of different frequencies. Out of these frequencies the organizer of the contest will choose your regatta frequency for the particular models, which the competitor will use during the contest. Disqualification will result, if the competitor does not comply to this rule. The organizer of the competition is required to inform all of the competitors of their regatta frequency, at the latest by registration.
- (14) Models made out of kits may enter the competition, however for static evaluation, it is required to supply supplementary documentation along with the plans that came with the kit.

- (15) The use of industrially produced parts, fittings and other items to finish the model is allowed. Nevertheless, according to point (8) of the "static evaluation regulations" such purchased parts will not be taken into consideration by the static evaluation committee and are classed as nonexistent.
- (16) Evaluation of the regatta is carried out separately for each of the above listed under paragraph 13.1 classes, irrespective of the fact that the models of different classes participated in one heat or in different heats. This also applies to a heat that has mixed aged groups, these will also be separately evaluated.
- (17) Wherever the rating or number of points are calculated, the results are rounded to hundredths.
- (18) Visible counter balances in jib booms are forbidden.
- (19) Using the rudder like an oar (wiggling) or wiggling with the sails for the purpose of forward momentum are forbidden. Non-observance will be penalised with a penalty circle, repeated non-observance will be penalised with disqualification from this heat.
- (20) A downhaul (kicking) is also allowed on models whose originals were not equipped with this fitting.
- (21) Visible measures to improve the steer ability and raise the reliability of a model while on the regatta course (e.g. various deflectors for sheets) are allowed for the purposes of the operational safety of the model. They must be installed when presenting the model in the static evaluation. If such measures are used and are not present in the documentation, then an adequate amount of points will be deducted during the static evaluation.
- (22) Visible measures to improve the water tightness of the model while on the regatta course (e.g. sealing the hatch lids with adhesive tape) are allowed for the purposes of the operational safety of the model. They are classed as safety measures for border-valued weather conditions, therefore must not be visible during the static evaluation, but can be applied at short notice during the competition, if the weather conditions were to roughen. The measures used for sealing the model may not serve the purpose of improving the steer ability as mentioned in point (21).
- (23) Square sails of the models of the NSS-C class have to be verifiably radio-controlled. The examination committee or the stage landing executive are entitled to request the competitor to provide proof. Nevertheless, the sail area may be altered by reefing or removing of sails according to point (7) of paragraph 13.4. Models with square sail dummies that cannot be radio-controlled are to be assigned to the classes NSS-A or NSS-B respectively, according to their rigging.
- (24) Random checks of the models data may be carried out during the static evaluation as well as immediately after a regatta heat. The deviations allowed



for the individual parameters may not exceed +/- 5% per value (according to the information entered in the "model certificate NSS"). However, the maximal deviation of the rating  $R_{log}$  calculated from the measured values may not be higher than 0,02 compared to the rating  $R_{log}$  that was calculated based on the data in the "model certificate NSS".

The water that has entered the model during the heat has to be removed before measuring the model. The sail area that is measured is to be the maximum sail area, even if it was not fully set during the particular heat. The sails that represent the maximum sail area have to be displayed during the random check.

**Models which exceed the allowed deviation of the rating  $R_{log}$  will be disqualified**

### **13.5 Requirements for the Starting Area**

The following requirements must be met during international competitions and championships, in the course of national competitions they can be regarded as recommendations, if not otherwise specified in the NS rules.

#### **13.5.1 Materials for the Starting Area**

- minimum requirements for the rescue boat (2 people, motor driven, maximum speed at least 2 m/s)
- anemometer (displayed in Beaufort scale) with max. memory, firmly mounted on a tripod in open ground
- frequency scanner with log function
- starting system (a so-called start tape, as commonly used by the F-classes)
- binoculars
- weather protection as well as chairs for starting area judges and assistants
- 2 stopwatches
- a communications device for each starting area (can be omitted, if no other starting area is active except for NSS)
- landing stage that meets the "Technical and sporting regulations for NS-classes", paragraph 8.4. Landing stage (construction and characteristics), load carrying capacity of 500 kg
- buoy anchorage with 2 weights
- measuring pool that is big enough for the models that participate, hand mirror and a source of light so as to check the loaded waterline length of a model
- scales that can measure up to at least 50 kg with a tolerance of +/-50g or better, to check the displacement of a model
- Lifejackets for the rescue boat drivers and model owners.
- megaphone

### 13.5.2 Staffing the Starting Area

- the personnel or helpers working in the starting area should be clearly marked (e.g., SAR for rescue staff)
- landing stage executive – leader judge, 2 buoy judges to uphold the rules and regulations, 1 secretary and 3 time keepers (the time keepers do not need to be judges)
- at least 1 rescue boat driver who, if necessary, can rescue the model with the respective owner.

### 13.5.3 General requirements

- English communication in all sailing classes during international competitions and championships (judges as well as competitors)
- during NSS heats, if possible, no other classes are to start (to make sure there are no problems with the frequencies).
- random checks of the models data immediately after a regatta heat
- an information meeting for all competitors before the regatta starts (briefing)
- audience orientated competitions, nevertheless, the area for the competitors is cordoned off.

### Supplement for the uniform construction evaluation of the class F4b and F4c

#### **Class F4-B**

Model ships, which were built from kits or material packages, which must undergo a driving test and final inspection.

- For standard kits (*kit and original pattern of the kit must be included and presented in the documentation of the model*), with specially industrially manufactured for this kit-etched, as purchased parts, can (*Assembly Instructions of these parts must be included in the documentation of the model*) are added. There is a possibility of improvement through the use of other materials, new technologies, such as: 3D milling, 3D printing, 3D printing, laser cutting, photo-etching, etc.
- Hull, deck and superstructure must be from the kit. If need be components from the modular replaced (defective components) are this document (with photo).
- Additions must be documented in a special journal, and be marked on the plan with photo.

**Class F4-C:**

Plastic models of injection moulding, which must pass a driving test and final inspection. In order to refine the model specific changes to the equipment of the model may be made using other materials.

- For standard kits (*kit and original pattern of the kit must be included and presented in the documentation of the model*) the improved, or can be changed with the use of other materials and new technologies: 3D milling, 3D printing, 3D printing, laser cutout, the photo-etching, etc.. However, the need to: its hull, the deck and the construction of modular content.
- additions must be documented in a special journal.

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*Borchers, Hans-Jürgen*

*Hardessemstraße 13*

*D 31177 Harsum*

*Deutschland*

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**In case of discrepancy between the original rules in German and their translation, the original version (in German) applies, apart from the paragraphs for NSS.**

**Translation:**

**Borchers, Hans-Jürgen**