



**BRITISH  
COLUMBIA**

Ministry of Forests  
and Range

# **Board of Scaling Examiners (BOSE)**

## **Examination Standards**

**May 29, 2007**



Revenue  
Branch

**Table of Contents**

Coast Examination .....3

    a. Written Paper ..... 3

    b. Net Scale Volume ..... 3

    c. Species/Grading ..... 4

    d. Accuracy ..... 5

Interior Examination .....7

    a. Written Paper ..... 7

    b. Net Scale Volume ..... 7

    c. Grading and Accuracy ..... 8

Practical Exam (Interior) Standards 2007 .....9

Marking .....10

Tools ..... 11

Results ..... 11

Recommendation Letters to the Chief Forester .....11

Issuance of Scaling Licenses ..... 11

Filing of Exams ..... 11

## Coast Examination

The Coast examination consists of two parts: a written exam and a practical exam. Candidates are given a maximum of five hours for the written exam, while a maximum of eight hours is given for the practical exam, which requires the scaling of 90 logs. To pass the examination, a candidate must obtain at least 50 percent of the marks in each of four categories (the grading and accuracy categories include large and small diameter groups – each requiring 50 percent minimum to pass) and at least 75 percent of the total marks.

The following categories are included:

		Maximum Marks	Minimum Pass
Written paper		25	12.5
Net scale volume		40	20
Grading:	Large diameter logs	15	7.5
	Small diameter logs	5	2.5
Accuracy	Large diameter logs	12	6
	Small diameter logs	3	1.5
Total		100	75

### a. Written Paper

The written paper mark is expressed as a percentage. The mark on the paper is multiplied by 0.25 for inclusion in the final mark.

For example, if the mark on the written paper were 79%, the marks for the category would be calculated as follows:

$$79\% \times 25 = 19.75$$

*Round to 20 marks*

### b. Net Scale Volume

The scaled logs are marked as five groups (60 large diameter logs broken into three groups of 20 logs, 30 small diameter logs and one group of all 90 logs). The net length, net top radius, and net butt radius recorded for each log are used to compute the net volume. The net volume of each group is compiled and the percent difference from the master scale is calculated. Marks are allocated as follows:

Difference %	Mark
0.0 to 3.0	100 - (% difference x 3.333)
Over 3.0 to 5.0	90 - ((% difference - 3) x 10)
Over 5.0 to 8.0	70 - ((% difference - 5) x 23.333)

The allocation of marks resulting from the above formulae is graphically demonstrated in the following table:

Difference %	Mark %	Difference %	Mark %
0.5	98	4.5	75
1.0	97	5.0	70
1.5	95	5.5	58
2.0	93	6.0	47
2.5	92	6.5	35
3.0	90	7.0	23
3.5	85	7.5	12
4.0	80	8.0	00

The sum of the marks for the five groups is divided by five to obtain a percentage mark for the category and is multiplied by 0.4 and rounded to two decimal places for inclusion in the final mark.

For example, if the percentages for the five volume groups were 75%, 96.25%, 92.5%, 68.83% and 98.55%, the marks for the category would be calculated as follows:

$$\frac{(75.00\% + 96.25\% + 92.50\% + 68.83\% + 98.55\%)}{5} = \frac{431.13}{5} = 86.23$$

$$86.23 \times 0.4 = 34.49 \text{ marks out of a possible 40}$$

### c. Species/Grading

Grading is marked in two groups; the first group contains 60 large diameter logs and the second group contains 30 small diameter logs. For the large diameter group, a count of each incorrectly recorded species and grade is made and the total count subtracted from 60 and the result is multiplied by 100 and divided by 60 to obtain a

percentage mark for the group. That mark is multiplied by 0.15 and rounded to two decimal places for inclusion in the log mark. For the small diameter group, a count of each incorrectly recorded species and grade is made and the total count subtracted from 30 and the result is multiplied by 100 and divided by 30 to obtain a percentage mark for the group. That mark is multiplied by 0.05 and rounded to two decimal places for inclusion in the log mark.

For example, if 20 grading errors were recorded for the large diameter group and 5 for the smaller diameter group, the marks for the category would be calculated as follows:

$$(60 - 20) \times \frac{100}{60} \times 0.15 = 10.00 \text{ marks}$$

and

$$(30 - 5) \times \frac{100}{30} \times 0.05 = 4.17 \text{ marks}$$

$$10.00 + 4.17 = 14.17 \text{ out of a possible 20 marks}$$

Marks for the two grading groups are rounded to two decimal places, and then summed to obtain a mark for the grading category

#### **d. Accuracy**

Accuracy is marked in two groups: the first group is for 60 large diameter logs and the second group is for 30 small diameter logs. For the large diameter group, a count is made of each log with an incorrectly recorded gross length and gross radius out by more than one radius class, then the total number of logs with accuracy errors is subtracted from 60 and the result is multiplied by 100 and divided by 60 to obtain a percentage mark for the group. That mark is multiplied by 0.12 for inclusion in the log mark. For the small diameter group, a count is made of each log with an incorrectly recorded gross length and gross radius out by more than one radius class, then the total number of logs with accuracy errors is subtracted from 30 and the result is multiplied by 100 and divided by 30 to obtain a percentage mark for the group. That mark is multiplied by 0.03 for inclusion in the log mark.

For example, if 24 accuracy errors were recorded for the large diameter group and 6 for the small diameter group, the marks for the category would be calculated as follows:

$$(60 - 24) \times \frac{100}{60} \times 0.12 = 7.20 \text{ marks}$$

and

$$(30 - 6) \times \frac{100}{30} \times 0.03 = 2.40 \text{ marks}$$

$$7.20 + 2.40 = 9.60 \text{ out of a possible 15 marks}$$

Marks for the two accuracy groups are rounded to two decimal places, and then summed to obtain a mark for the accuracy category.

To obtain a log mark the volume, grading and accuracy marks are summed then rounded to the nearest whole number. The written mark is added to the log mark to obtain the final mark.

Using the results from the previous examples, the log mark and final mark would be calculated as follows:

Volume	34.49			
Grading	14.17		Written Mark	20
Accuracy	9.60		Log Mark	58
Log Mark	58.26		Final Mark	78

## Interior Examination

The Interior examination consists of two parts: a written exam and a practical exam. Candidates are given a maximum of five hours for the written examination and a maximum of six hours for the practical examination, which requires scaling and reporting scale results for 60 logs.

To pass the exam, candidates must achieve at least 50 percent in each of three categories and at least 75 percent of the overall exam marks.

Marks are allotted as shown in the following categories:

	Maximum mark	Minimum pass
Written paper	40	20
Net scale volume	20	10
Grading and Accuracy	40	20
Total	100	75

### a. Written Paper

The written paper mark is expressed as a percentage. The mark obtained on the written paper is multiplied by 0.4 for inclusion in the total mark for the examination.

### b. Net Scale Volume

The net length, net top radius, and net butt radius recorded for each log are used to compute the net volume.

Examiners compile the net volumes. The net volume is used to compute the mark for net scale volume.

The percentage difference of the candidate's net volume from the master scale net volume is calculated. Marks are allocated as follows:

Difference %	Mark
0.0 to 3.0	$100 - (\% \text{ difference} \times 3.333)$
Over 3.0 to 5.0	$90 - ((\% \text{ difference} - 3) \times 10)$
Over 5.0 to 8.0	$70 - ((\% \text{ difference} - 5) \times 23.333)$

The allocation of marks resulting from the above formulae is graphically demonstrated in the following table:

Difference %	Mark	Difference %	Mark
0.5	98	4.5	75
1.0	97	5.0	70
1.5	95	5.5	58
2.0	93	6.0	47
2.5	92	6.5	35
3.0	90	7.0	23
3.5	85	7.5	12
4.0	80	8.0	00

The mark is multiplied by 0.2 before being included in the total mark for the examination.

**c. Grading and Accuracy**

From the 48 marks allotted to this category, 1.0 mark is deducted for each incorrect species and each incorrect grade.

A further 0.5 of a mark is deducted for each incorrect gross length, gross radius out by more than one radius class, and each type of procedural error made in recording the scale details.

The mark remaining after the deductions is multiplied by 0.833 for inclusion in the total mark for the examination.

## Practical Exam (Interior) Standards 2007

These are the minimum requirements to set and correct practical log scaling exams in the Interior of BC:

<b>Exam Set Up</b>	
Number of pieces	60
Number of different species	7 minimum
Number of different grades	5 or all – Maximum of 3 logs with 2 grades per exam
<b>Marking</b>	
Grades	Incorrect grade = accuracy error
Species	Incorrect species = accuracy error. Do not provide species code list
Lengths	All lengths to be measured with a tape
Gross dimensions	Incorrect entry = accuracy error
Net dimensions	Allow the regional representative of the BOSE to give some latitude for up to 2 transposition errors. If there are more than 2 of these errors, the volume will be calculated on actual entries.
Procedural errors	Not considered for species, grades, and gross dimensions. Latitude in marking is the same as for net dimensions (net volume).

## Marking

Volume – 20 marks, Written – 40 marks, Accuracy & Grading – 40 marks.

Must score 50% on each part and 75% for the full exam.

Rounding for marking is as follows:

- Round the written, volume, and grading/accuracy parts of the exam to one decimal place. For example; Written -- 25.6, Volume – 16.2, Accuracy/Grades – 32.9
- Add the marks together for the final mark (no rounding).
- Mark must a minimum of 75.0 to pass. The example shown equals 74.7 and fails.

Where there is doubt about the use of latitude during the marking of an exam the decision must be referred to a regional member of the BOSE.

Practical exam length is 6 hours.

Logs must not be rolled by the candidates during the practical exam.

Where the minimum requirements:

- to set an exam can not be met, the exam must not be conducted
- can not be met, the BOSE will not recommend the successful candidates to the Chief Forester for licensing.

This guide will be used to set up an Interior scaling exam including all other applicable requirements as per the scaling manual where the manual does not conflict with these standards.

## **Tools**

The use of non-programmable calculators will be permitted for both the practical and written portions of all scaling exams. Approved calculators will be distributed by an examiner and will be collected at the end of each portion of the exam.

## **Results**

After regions have completed marking and reviewing exams with any interested examinees, they will be forwarded to the Scaling Policy Forester at Revenue Branch. A copy of the notification of exam results for successful candidates will be sent to the Scaling Policy Forester who will ensure that the Chief Forester is contacted and the Scale Control System (SCS) is updated. Exams will be filed regionally.

## **Recommendation Letters to the Chief Forester**

Letters to successful candidates should state, “We have recommended to the Chief Forester that you be issued a scaling licence”. The letter must not state that a candidate will be issued a scaling licence.

## **Issuance of Scaling Licenses**

The Chair of the Board of Scaling Examiners will first review the results and ensure that the Examination Standards were met. A scaling license may then be issued to the successful candidate by the Chief Forester or his delegate.

## **Filing of Exams**

Exams are to be filed at the Region. They will be forwarded to the Policy Forester; a licence may then be issued and entered into SCS. The exam will then be returned to the Region.