SEM Testing Tariffs

A Consultation Paper

July 2011

EXECUTIVE SUMMARY

Testing tariffs are applied to units under test in the Single Electricity Market (SEM). Tariffs are applied on the basis of the registered capacity of the generator unit. Since the introduction of the SEM in November 2007, the testing tariffs applied to Generator Units Under Test (GUUT) have remained unchanged since they were developed and consulted upon in 2005. EirGrid and SONI now consider it appropriate that a consultation be published which explains the methodology of the testing tariffs and takes into account feedback received from generators since the introduction of the SEM. The paper then proposes a new schedule of testing tariffs that are more cost reflective of the current costs incurred when a unit is under test in the SEM.

There are a number of costs that the TSOs consider are appropriate for inclusion in the testing tariffs. These costs relate to the additional operational reserve carried to maintain system security when a unit is testing, the effect a GUUT has on unit commitment decisions, and the costs incurred when a unit's output drops very quickly.

Generator units go through three phases of testing when they are being commissioned. Each phase has its own reserve requirement and the generator must fulfil certain criteria to progress from phase to phase. Upon successful completion of each phase, the generator is deemed to be more reliable and the likelihood of the unit tripping is expected to decline as testing progresses. For non-commissioning units which require testing, the three phases of testing also exist. Although the majority of non-commissioning units will be Phase 3, the TSOs will assess, in conjunction with the Generator, the appropriate phase of testing for each generator taking the reliability of the generator unit and potential risk to system security into account.

The first two phases of testing have an increased reserve requirement and it is this in particular that drives TSO costs. It is proposed that the testing tariffs will reflect the phase of testing that the generator is in, in order to reflect the difference in costs incurred by the TSO during the three phases. It is proposed that there will be two testing tariffs, testing tariff A and testing tariff B. Testing tariff A will be applicable to phases one and two of testing, while testing tariff B will be applicable to Phase 3.

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1.0 INTRODUCTION

Testing tariffs are applied to all generator units that may be granted under test status in SEM. The appropriate testing tariff is selected from a schedule of charges on the basis of the SEM regisitered capacity of the Generator Unit Under Test (GUUT). The GUUT's testing charge is calculated for each half hour while they under test, and is the product of the testing tariff and all positive metered generation. The GUUT status will apply for the full trading day and the GUUT nominates a profile of their testing output pre-Gate Closure. Sections 5.168 to 5.184 of the Trading and Settlement Code sets out in more detail a number of the criteria for GUUT.

There are two types of generator tests considered in this paper. One type of testing is when new units are being commissioned on to the power system for the first time. In this case the generator will request to be a GUUT to carry out a range of tests to demonstrate Grid Code compliance to the system operator and to test their own equipment. The other type of testing occurs when existing units already commissioned on the power system request to become a GUUT to demonstrate Grid Code compliance or if they wish to test their equipment when returning from outages. In both types of testing the impact of the GUUT is an increase in the costs associated with manintaing system security. The testing tariffs are paid by the GUUT to SEMO where they offset these costs by contributing to the imperfections pot.

At present there is one testing tariff applied to all GUUT on the basis of registered capacity, and these are outlined in Table 1.1 below. The current existing generator testing charges were consulted upon by ESB National Grid in 2005[1]. These tariffs have continued to apply in the period since SEM was established in 2007 as per AIP/SEM/07/455, SEM-08-093 and SEM-09-089.

Unit Capacity	€/MWh
GEN ≤ 50	3.58
50 < GEN ≤ 100	3.33
100 < GEN ≤ 150	3.53
150 < GEN ≤ 200	4.12
200 < GEN ≤ 250	4.89
250 < GEN ≤ 300	6.09
300 < GEN ≤ 350	8.43
350 < GEN	11.27

Table 1.1 Existing testing tariffs in SEM

It is proposed to now apply two different testing tariffs to GUUT dependent on the type of test being carried out and the risk to the system security. One testing tariff will apply during periods where there is an increased system reserve requirement (high risk) and the other testing tariff will apply during periods of lower system risk where there is no increase in the system reserve requirement (lower risk). The subsequent sections set out the methodology and background on the costs arising from GUUT.

[1] Generator Testing Charges, background and calculation. ESB National Grid, 2005.

2.0 GENERATOR TESTING AND TESTING TARIFFS

Testing of a new generator unit or of an existing generator unit returning from major overhaul is required by the transmission system operator (TSO) in advance of the plant becoming fully operational. During such testing the generator will be classified as a GUUT in the SEM. A unit may also request with the TSO to be classified as a GUUT in SEM to carry out their own testing, for example for maintenance works.

GUUT status in the SEM has a number of advantages for the generator. These include the flexibility to nominate its output and conduct unit tests while being exempt from the application of short notice declaration and trip charges.

Testing tariffs are applied on a €/MWh basis to units that have been granted GUUT status in the SEM. The testing tariff applied is determined on the basis of a generator unit's registered capacity. Typically units with a larger registered capacity pay a higher testing tariff on all the MWh the units generate. This is considered reflective of the higher system risk associated with the sudden loss of large generator and their impact on unit commitment decisions.

Under the current Trading & Settlement Code, testing tariffs may be applied to any unit that is not an autonomous generator unit, pumped storage unit, demand side unit, interconnector unit or interconnector residual capacity unit.[2]

Testing tariffs are intended to encourage the following principles:

1. **Efficient Testing** - testing should be carried out in an efficient and prompt manner.

2. **Cost reflectivity** – where charges are imposed they should be proportionate and cost reflective. Due consideration has been given to making the proposed testing tariffs as cost reflective as possible.

3. **Positive Incentives** – by proposing two different testing tariffs the TSOs are providing a clear financial incentive to units under test to progress through testing promptly

2.1 COST OF TESTING

The actual costs incurred that may be attributed to the GUUT are highly volatile and variable. As such, generators pay for the costs of testing based on an agreed schedule of charges. The testing tariffs that are proposed in this paper have been set at a level that should, on average, recover the additional costs imposed on the power system during generator testing. It should be noted that zero provision has been made for the net contribution of generator testing charges to the dispatch balancing costs (DBC) budget forecast as the costs of testing are assumed to be recovered through the testing tariffs. A GUUT leads to increased system operating costs for several reasons.

- The TSO may need to commit extra units to ensure a rapid response to changes from the GUUT's scheduled output and to ensure that the system would remain within normal security standards following the loss of the GUUT. This leads to additional DBC in the SEM.

[2] Two Modification Proposals to the Trading and Settlement Code, relating to Interconnector Under Test and Pumped Storage Under Test, have been raised by the TSOs and are being progressed by the Modifications Committee, as discussed in Section 2.3.

- As the GUUT typically poses a higher risk of tripping, additional operating reserve will be required to ensure that system security is not compromised. The costs associated with units tripping while under test is currently recovered through the testing tariff mechanism. Units under test in the SEM are exempt from trip charges.

- Increases in the amount of operating reserve will result in increased Ancillary Service (AS) reserve payments to the other generators that provide the reserve.

- Potential increase to the overall reserve requirement if the testing unit's output increases the existing reserve requirement on the system.

2.2 GENERATOR TESTING

All generator testing has to be considered when designing the testing tariffs for SEM. One major driver of generator testing is commissioning. In addition to the generator's own requirements for testing, during commissioning a unit will be required to undergo Grid Code compliance testing. For example, a conventional unit the testing involves in excess of 70 separate tests. Other drivers of generator testing include the return from long term or maintenance outages, Grid Code compliance testing and a generator's own testing requirements.

To ensure system security, the TSO divides testing into phases according to the reliability of the GUUT. It is proposed that different testing tariffs will apply depending on which phase the unit is assumed to be operating in. This section outlines the phases during testing and the associated system reserve requirements. There are three phases of testing that a unit undergoes:

- **Phase 1 Test Criteria -** In this phase, the unit is considered to be highly unreliable and it is necessary to have sufficient system reserve on line to cover 100% of the MW produced by the generator under test.

- **Phase 2 Test Criteria -** The unit is assumed to be more reliable than in Phase1 but not as reliable as a unit in normal operation. Sufficient system reserve to cover 90% of the MW produced by the generator under test will be maintained.

- **Phase 3 Test Criteria -** At this stage of testing the unit is deemed to be reasonably reliable and normal reserve rules will apply. However, any tripping or unreliable behaviour or known reliability problems occurring during Phase 3 testing may require a restart of Phase 2 with the appropriate operating conditions being restored. Typically, Phase 3 testing will apply to a GUUT during latter stages of commissioning and other general testing on an ongoing basis.

Units commissioning for the first time will be deemed to commence testing in Phase 1 and will need to demonstrate sufficient reliability to progress to Phase 2 and Phase 3 of testing. For generator units returning from a major outage or overhaul, the TSO will determine which phase of testing the unit will commence in. This determination will be based on the reserve requirement and unit commitment decisions while the unit is classified as a GUUT. Any unreliable behaviour or known reliability problems occurring during any phases of testing may require a repeat of that particular phase.

2.2.1 TEST PHASE CRITERIA REFERENCE

The completion of the different phases of testing is based on a simple assessment of the reliability of the unit. The unit output is measured against the Registered Capacity of the unit and defined minimum running requirements that the generator must achieve before proceeding to the next reliability level are set.

When testing individual units in sequential stages on a multi shaft CCGT module (i.e. gas turbine and steam turbine units that are on separate shafts) the module output is measured against the Registered Capacity of the individual unit under test. When testing units together (i.e. a gas unit and a steam unit) the module output is measured against the Registered Capacity of the combined units. When testing as a combined module the phase of testing that the module is considered to be in will be the lowest test Phase of any of the units.

Take the example of a 310MW multi shaft CCGT module consisting of two 100MW gas unit and one 110MW steam unit. Each gas unit may test individually and proceed through Phase 1 and Phase 2 tests based on each unit's output measured against 100MW. When it comes to commissioning the steam unit, this will commence in Phase 1 for both gas and steam units, even if the gas units have already passed through Phase 1 testing, and will be measured against a combined capacity of 310MW.

2.2.2 PHASE 1 TEST CRITERIA

In this phase, the unit is considered to be highly unreliable and it is necessary to have sufficient reserve on line to cover 100% of the MW produced by the generator under test.

To complete this phase the generator under test will have to complete a minimum of:

- 48 hours running at loads in the range 50%-100% of the Registered Capacity and
- 5 hours continuous running at loads in the range 75% - 100% of the Registered Capacity.

The 5 hours of continuous running may contribute to the 48 hours of running in the range 50%-100%.

Any unreliable behaviour or known reliability problems occurring during Phase 1 testing may require a repeat of this phase of testing.

2.2.3 PHASE 2 TEST CRITERIA

The unit is assumed to be more reliable than in Phase 1 but not as reliable as a unit in normal operation and it is necessary to have sufficient reserve on line to cover 90% of the MW produced by the generator under test.

To complete this phase the generator under test will have to complete a minimum of:

- 72 hours continuous running at loads greater than 90% of the Registered Capacity.

As with Phase 1, any tripping during the 72 hours will require a repeat of this phase. Any unreliable behaviour or known reliability problems occurring during this phase may require that Phase 1 operating conditions be restored.

2.2.4 PHASE 3 TEST CRITERIA

At this stage of testing the unit is deemed to be reasonably reliable and normal reserve rules will apply.

Any tripping or unreliable behaviour or known reliability problems occurring during Phase 3 testing may require a restart of Phase 2 with the appropriate operating conditions being restored.

2.3 TESTING OF DEMAND SIDE UNITS, PUMPED STORAGE AND INTERCONNECTORS

The TSOs believe that it is appropriate at this time to discuss the application of testing tariffs for Demand Side Units, Pumped Storage units and Interconnectors. However, as the Trading and Settlement Code does not currently make provision for Demand Side Units, Pumped Storage units or Interconnectors to be granted Under Test status in SEM, modification(s) to the SEM rules would be necessary. The TSOs have raised modifications to the Trading and Settlement Code to address the testing and application of testing tariffs to Pumped Storage units and Interconnectors, which are being progressed with the Modifications Committee. These modifications are Mod_10_11: Interconnector Under Test and Mod_14_11: Pumped Storage Under Test. The TSOs are investigating the status of Demand Side Units Under Test.

3.0 COSTS ATTRIBUTABLE TO GENERATOR UNITS UNDER TEST

There are four distinct cost components associated with managing a GUUT. The first three cost components (additional reserve constraint cost, increased cost of operational reserve, and additional run hours) directly relate to the TSOs policy regarding operational security when managing a GUUT. The fourth cost component, for generator trips, is related to the performance of the unit and is seen as a component that is under the control of the GUUT. The components of the testing tariffs are discussed below with a corresponding description of how the cost was determined and analysis of the results. The studies, calculations and discussion in this section are underpinned by a number of assumptions as follows:

- The current largest generator unit connected to the transmission system on the island of Ireland is 445MW.
- The level of reserve carried is reflective of the reserve guidelines being implemented at the time the studies and calculations were carried out.
- The reserve payment rates are correct at the time of writing this paper in accordance with the Statement of Payments and Charges 2010/2011[3].

3.1 INCREASED RESERVE

Additional reserve constraint costs and increased costs of operating reserve typically only occur when the GUUT is deemed to be a high risk to the system and operating reserve levels above normal requirements are necessary, for example during the commissioning of a generator unit. When the output of the GUUT exceeds the normal operating reserve requirement, the TSOs will increase primary operating reserve (POR) and secondary operating reserve (SOR) for system security. For this reason additional reserve constraint costs and increased costs of operating reserve will be considered applicable to Phases 1 and 2 of testing only.

Testing tariffs in the SEM are applied on the basis of the registered capacity of the GUUT. To prevent over recovery of testing charges it is necessary to take account of load factors and to apply a load factor adjustment. Without the application of this load factor adjustment the GUUT would be covering the cost of additional operating reserve at times when its output was such that only normal operating reserve was required. The load factor adjustment is designed in such a way that the costs recovered over the entire duration of testing will cover the total cost of the increased operating reserve payments to other generators and the additional reserve constraint during that same period.

The load factor adjustments were calculated by analysing a sample set of generators that had previously completed commissioning testing in the SEM. Based on the testing tariff bands the load factor at which the generator in that band exceeds the normal operating reserve requirement was calculated. It is only when the generator exceeds this load factor that it is actually causing an increase to the operating reserve requirement. The load factor adjustment is the percentage of total MWh outputted when the GUUT exceeded this load factor.

[3] Available from:
http://www.eirgrid.com/media/2010%202011%20Harmonised%20Ancillary%20Service%20Statement%20of%20Payments%20and%20Charges.pdf

3.1.1 RESERVE CONSTRAINT COST

In the unconstrained market schedule in the SEM, generation is scheduled in order of increasing cost until demand is met. This usually means that efficient thermal generators (such as CCGTs) are scheduled at high output and more expensive, less efficient generators are not scheduled as frequently.

In order to provide operating reserve, efficient thermal generators are pulled back, or constrained down, from their most economic generating level, and additional more expensive generators are dispatched or constrained on to meet system demand. This is called a reserve constrained schedule. The reserve constraint cost arises from the difference in production cost between the unconstrained market schedule and the more expensive reserved constrained schedule.

A generator under test may require extra operating reserve to cover the additional risk of that generator tripping. Carrying extra reserve in this manner means that the reserve constrained schedule will deviate further from the unconstrained market schedule and result in additional reserve constraint costs. This cost must be accounted for and the calculation methodology below describes how this cost is determined.

CALCULATION METHODOLOGY

The additional reserve constraint cost is calculated using the production cost outputs from a validated reserve constrained model of the SEM. The modelling is performed using the Plexos modelling tool. The model uses the Regulatory Authorities validated generator dataset to represent the generators in the SEM. The transmission system is not modelled.

The additional reserve constraint cost is then found by taking the difference in production cost between a base case model with a 'normal' reserve requirement and a model with an additional reserve requirement over and above the 'normal' requirement. The cost is then converted to a per MWh basis by dividing the total figure by the product of the amount of hours in a year times the registered capacity of the GUUT. The calculations are then repeated for a number of GUUT sizes to provide a range of charges banded by unit size. The load factor adjustment is then applied to produce the final €/MWh rate applicable to each band of registered capacity.

RESULTS

Table 3.1.1 shows the results from this study separated by Phase 1 and Phase 2.

Phase 1		**Phase 2**	
Generator Capacity	**€/MWh**	**Generator Capacity**	**€/MWh**
GEN <50	-	**GEN <50**	-
50 < GEN ≤100	-	**50 < GEN ≤100**	-
100 < GEN ≤ 150	-	**100 < GEN ≤ 150**	-
150 < GEN ≤ 200	-	**150 < GEN ≤ 200**	-
200 < GEN ≤ 250	-	**200 < GEN ≤ 250**	-
250 < GEN ≤ 300	-	**250 < GEN ≤ 300**	-
300 < GEN ≤ 350	-	**300 < GEN ≤ 350**	-
350 < GEN ≤ 400	€0.21	**350 < GEN ≤ 400**	-
400 < GEN ≤ 450	€1.44	**400 < GEN ≤ 450**	€0.28
450 < GEN	€4.02	**450 < GEN**	€1.33

Table 3.1.1 Added Reserve Constraint Costs for Phases 1 and 2

3.1.2 RESERVE PREMIUM

The constraint cost for the increase in operating reserve is recovered by the additional reserve constraint cost component. Generator units on the system also receive an ancillary service payment for the availability and provision of operating reserve. The extra ancillary service reserve payments are not captured by the additional reserve constraint calculation methodology. The rates at which operating reserve are paid are set out in the AS Statement of Payment and Charges 2010/11[4]. It is considered appropriate that the GUUT that is causing an incremental increase in operating reserve should cover the incremental cost of increased operating reserve payments through the testing tariff mechanism.

CALCULATION METHODOLOGY

The aim of this methodology is to recover the cost of the increased operating reserve payments to the other generators on the system. It is appropriate that the GUUT should cover these costs when its output is such that additional reserve is required.Furthermore the GUUT should only cover the cost of the increase in operating reserve above the normal operating reserve requirement. The normal operating reserve requirement referenced in the text assumes the current largest unit (assumed to be 445MW) is synchronised to the power system and is generating at its maximum output.

By applying the load factor adjustment to the ancillary service payment rates for operating reserve, a €/MWh value is calculated that can be added to the testing tariff as the reserve premium component. The reserve premium is made up of primary, secondary, and tertiary operating reserve payment rates multiplied by the load factor adjustment appropriate to the particular testing tariff band.

RESULTS

Table 3.1.2 shows the results from this study separated by Phase 1 and Phase 2.

Phase 1		**Phase 2**	
Generator Capacity	**€/MWh**	**Generator Capacity**	**€/MWh**
GEN <50	-	**GEN <50**	-
50 < GEN ≤100	-	**50 < GEN ≤100**	-
100 < GEN ≤ 150	-	**100 < GEN ≤ 150**	-
150 < GEN ≤ 200	-	**150 < GEN ≤ 200**	-
200 < GEN ≤ 250	-	**200 < GEN ≤ 250**	-
250 < GEN ≤ 300	-	**250 < GEN ≤ 300**	-
300 < GEN ≤ 350	-	**300 < GEN ≤ 350**	-
350 < GEN ≤ 400	€0.13	**350 < GEN ≤ 400**	-
400 < GEN ≤ 450	€0.34	**400 < GEN ≤ 450**	€0.15
450 < GEN	€0.61	**450 < GEN**	€0.43

Table 3.1.2 Reserve premium component for Phases 1 and 2.

[4] Available from:
http://www.eirgrid.com/media/2010%202011%20Harmonised%20Ancillary%20Service%20Statement%20of%20Payments%20and%20Charges.pdf

3.2 ADDITIONAL RUN HOURS

In addition to the increased risk of tripping during testing, the unit can also be regarded as unreliable as it may not start or run as scheduled, or it may become unavailable at short notice. In this case, the energy that the GUUT would have generated had it been running will need to be replaced so that demand can be met. This power must be provided by online units as the notice time that the GUUT gives of its unavailability may not be sufficient time to start and run up another generator unit.

To manage the risk to the system that this unreliability poses, the TSO must constrain on additional unit(s) to mitigate the risk of the GUUT becoming unavailable. The additional run hour cost component is intended to represent the cost arising from scheduling this additional generation.

CALCULATION METHODOLOGY

This calculation again utilises outputs from the relevant Plexos model. In this case, the annual run hours for each unit in the base case without a GUUT are compared to the annual run hours for each unit in the case with a GUUT. The additional run hours is the difference in run hours between the two cases and represents the number hours of generation in a year displaced by the GUUT. The model is run over a year to capture as accurately as possible all testing conditions.

The TSO may need to run some displaced generation to mitigate the risk of the GUUT becoming unavailable. The cost of running this additional generation is estimated as the idling cost (€/hr) of the particular generator times its additional run hours. The cost is then summed over all units and converted to a per MWh basis by dividing the total figure by the product of the amount of hours in a year times the size of the GUUT. The calculation is then repeated for a number of GUUT sizes to provide a range of charges banded by unit registered capacity.

Table 3.2.1 below shows a simplified additional run hour calculation. (Please note the values used in this table are purely for purposes of demonstration and do not represent actual values used in the calculation).

Unit under test size = 300 MW					
Unit	**Idle Cost (€/hr)**	**Base Case Run Hours (No Unit under Test)**	**Case 1 Run Hours (With Unit under Test)**	**Additional Run Hours**	**Cost of Additional Run Hours (€)**
		X	**Y**	**X - Y**	**(X - Y)* Idle Cost**
Gen 1	1500	6500	5500	1000	€ 1,500,000
Gen 2	1300	6000	5350	650	€ 845,000
Gen 3	3200	7000	6800	200	€ 640,000
Gen 4	1200	5000	3000	2000	€ 2,400,000
Gen 5	900	4500	3200	1300	€ 1,170,000
Total					€ 6,555,000
Cost per MWh		**Total Cost / {(Hours in a year)*(Unit under test size)}**			**€ / MWh 2.49**

Table 3.2.1 Example of Run Hour Calculation

RESULTS

Table 3.2.2 below contains the results from the additional run hour calculations. The additional run hour cost varies inversely with GUUT size. This is because the costs are spread over less MW as the unit size gets smaller.

Phase 1		Phase 2	
Generator Capacity	**€/MWh**	**Generator Capacity**	**€/MWh**
GEN <50	€9.39	**GEN <50**	€9.39
50 < GEN ≤100	€9.87	**50 < GEN ≤100**	€9.87
100 < GEN ≤ 150	€9.36	**100 < GEN ≤ 150**	€9.36
150 < GEN ≤ 200	€8.84	**150 < GEN ≤ 200**	€8.84
200 < GEN ≤ 250	€8.61	**200 < GEN ≤ 250**	€8.61
250 < GEN ≤ 300	€8.62	**250 < GEN ≤ 300**	€8.62
300 < GEN ≤ 350	€8.44	**300 < GEN ≤ 350**	€8.44
350 < GEN ≤ 400	€7.35	**350 < GEN ≤ 400**	€8.42
400 < GEN ≤ 450	€5.24	**400 < GEN ≤ 450**	€7.30
450 < GEN	€2.71	**450 < GEN**	€5.48

Table3.2.2 Additional Run Hours Costs for Phases 1 and 2.

3.3 TRIP CHARGES

When a generator experiences a sudden loss of output it is referred to as a trip. If the rate of loss is in line with the MW losses set out in Other System Charges Methodology Statement[5] it is subject to a trip charge. However, a GUUT in the SEM is exempt from paying any trip charges. Should a GUUT trip while undergoing testing, the cost to the transmission system of the trip remains so the cost must be recovered. For GUUT the recovery mechanism is through the testing tariffs. Stakeholders are invited to comment on whether they believe this is still the most appropriate manner to recover the cost of generator trips during testing.

CALCULATION METHODOLOGY

To calculate the trip component of the testing tariff it was first necessary to calculate the likelihood of a unit tripping in any given MWh of output. This likelihood can be expressed in terms of trips per MWh. The charge a unit would face if it tripped from a particular output is expressed in terms of cost of trip or €/trip. By multiplying these two variables together, i.e. trips/MWh and €/trip, it produces a cost component in terms of €/MWh which may be applied to the testing tariff.

This methodology can be applied to both commissioning units and non-commissioning units. Two datasets were used for this study, one for non-commissioning units and one for commissioning units. For non-commissioning units all the GUUT in the market for a period of over 3 years were studied. The commissioning unit dataset was based on a historical set of commissioning generators.

RESULTS

The result in Tables 3.3.1 and 3.3.2 below assume that the unit trips from close to its full registered capacity as shown in the MW Lost column. Generator units that are undergoing commissioning testing have higher cost due to the higher likelihood of tripping.

[5] Available from:
http://www.eirgrid.com/media/2010%202011%20Other%20System%20Charges%20Methodology%20Statement.pdf

Generator Capacity	€/MWh	
GEN <50	€	-
50 < GEN ≤100	€	-
100 < GEN ≤ 150	€	-
150 < GEN ≤ 200	€	0.36
200 < GEN ≤ 250	€	0.57
250 < GEN ≤ 300	€	0.90
300 < GEN ≤ 350	€	1.44
350 < GEN ≤ 400	€	2.30
400 < GEN ≤ 450	€	3.67
450 < GEN	€	5.87

Table 3.3.1: Commissioning generators trip charge component

Generator Capacity	€/MWh	
GEN <50	€	-
50 < GEN ≤100	€	-
100 < GEN ≤ 150	€	-
150 < GEN ≤ 200	€	0.19
200 < GEN ≤ 250	€	0.42
250 < GEN ≤ 300	€	0.66
300 < GEN ≤ 350	€	1.06
350 < GEN ≤ 400	€	1.69
400 < GEN ≤ 450	€	2.70
450 < GEN	€	4.32

Table 3.3.2: Non-commissioning generators trip charge component

3.4 TRANSMISSION CONSTRAINT COSTS

In order to facilitate a GUUT it may be necessary for the TSO to constrain the output of other generator units for thermal, voltage, stability or short circuit level reasons. This results in payments being made to constrained generators. This type of constraint may occur for example, if transmission reinforcements associated with the connection of a new generator unit, are not completed at the time of unit testing. While this constraint is distinct from the additional reserve constraint set out in section there are likely to be interactions between these constraints.

The cost associated with any such constraint is difficult to quantify as it varies with the location of the generator under test, the availability of other generator units, outages on the transmission system and the progress of new transmission reinforcements. As a result, this cost component is not included in the testing tariffs proposed.

3.5 SHORT NOTICE DECLARATIONS

Under normal operating conditions, short notice declaration payments are made by generators who re-declare their availability at short notice. Such declarations can result in a constraint cost as other generation must be re-dispatched. It is assumed that the cost associated with short notice declarations is covered by the additional run hours and the additional reserve constraint cost components of the testing tariffs. For this reason, a GUUT will not be liable for the specific application of short notice declaration charges.

4.0 PROPOSED TESTING TARIFFS

The TSO is recommending that two different testing tariffs (A and B) are applied to GUUT in the SEM. The type of testing tariff applied will be dependent on the level of reserve carried by the TSO, which is determined by the risk to the system of the testing. The two testing tariffs shall be called testing tariff A and testing tariff B. Both of these testing tariffs are calculated as the sum of the individual components discussed in Section 3.

4.1 TESTING TARIFF A

This testing tariff is intended to cover the system operator cost of higher risk testing, which is typically Phase 1 and 2 testing. This tariff would be used in scenarios where additional system reserve is required and there is a high risk of tripping of the generator. This tariff would typically, but not exclusively, apply in the early phases of commissioning a unit and is made up of the cost components calculated in the studies outlined in Section 3. The costs associated with this type of testing are the additional reserve constraint costs, the increased reserve premium, costs of tripping (commissioning units), and additional run hours. Historical analysis on previously commissioned generators showed a generator will typically export 30% of its combined Phase 1 and Phase 2 output while in Phase 1 of testing. Therefore, when summing the cost components calculated for Phase 1 and Phase 2 they will be given a weighting of 0.3 and 0.7 respectively. The final schedule for testing tariff A is shown below in Table 4.1.1.

Testing Tariff A

Generator Capacity	€/MWh
GEN <50	€9.39
50 < GEN ≤100	€9.87
100 < GEN ≤ 150	€9.36
150 < GEN ≤ 200	€9.20
200 < GEN ≤ 250	€9.18
250 < GEN ≤ 300	€9.53
300 < GEN ≤ 350	€9.88
350 < GEN ≤ 400	€10.49
400 < GEN ≤ 450	€11.19
450 < GEN	€13.15

Table 4.1.1 Rates Table - Testing Tariff A

4.2 TESTING TARIFF B

This testing tariff is intended to cover the costs when a unit enters Phase 3 of testing, either upon completing Phases 1 and 2 of testing or when an existing operational unit is granted GUUT status in SEM. This tariff would be used when a unit is under test in SEM but no additional system reserve is required. The cost associated with this type of testing is the cost of tripping (non-commissioning units). The final schedule for testing tariff B is shown below in Table 4.1.2.

Testing Tariff B	
Generator Capacity	**€/MWh**
GEN <50	-
50 < GEN ≤100	-
100 < GEN ≤ 150	-
150 < GEN ≤ 200	€0.19
200 < GEN ≤ 250	€0.42
250 < GEN ≤ 300	€0.66
300 < GEN ≤ 350	€1.06
350 < GEN ≤ 400	€1.69
400 < GEN ≤ 450	€2.70
450 < GEN	€4.32

Table 4.1.2 Rates Table - Testing Tariff B

4.3 ANNUAL ADJUSTMENT TO REFLECT FUEL PRICES

Reserve costs are highly dependent on both fuel prices and the price differential between different fuel types. As a result, testing tariffs with a component based on reserve costs would vary with fuel price. In order to mitigate the volatility due to fuel prices, it is proposed that although the testing tariff structure should remain fixed to provide certainty, the testing tariffs will be adjusted on an annual basis to reflect the forecast fuel prices for the following year.

NEXT STEPS

Respondents to this consultation paper are kindly requested to provide responses, views and comments on the following sections:

Section #	Section
2.0	Generator Testing and Testing Tariffs
3.0	Costs Attributable to Generator Units Under Test
4.0	Proposed Testing Tariffs

All responses should be addressed to Sean Connolly (Sean.Connolly@eirgrid.com) and provided no later than 5th August 2011. Should you wish your response to remain confidential, please indicate this when responding to this Consultation Paper.

All comments received will be provided to CER and NIAUR for information and also published on the TSOs website before the final decision paper is published. In accordance with the Trading and Settlement Code the Testing Tariffs will be published on SEMO website within 5 working days of receipt of the Regulatory Authorities' determination or 2 months before the start of the tariff year whichever is the later.