Calculation of the costs of efficient provision for some electronic communications services provided at the wholesale level in Romania

PoI COST MODEL DOCUMENTATION

ANCOM

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PUBLIC VERSION FOR CONSULTATION

TERA Consultants
32, rue des Jeûneurs
75002 PARIS
Tél. + 33 (0) 1 55 04 87 10
Fax. +33 (0) 1 53 40 85 15

S.A.S. au capital de 200 000 €
RCS Paris B 394 948 731

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Summary

0 Context and objectives

0.1 Regulatory context

Taking into account the European Commission Recommendation mentioned under Article 15 of the Directive 2002/21/CE, ANCOM reviewed beginning 2012 the different relevant markets in order to identify operators with a significant market power. Significant market power operators have to provide some wholesale electronic communication services at efficient cost-oriented tariffs, based on cost models.

ANCOM, as the regulatory authority of Romania, intends therefore to assess the costs of the different wholesale services provided by operators. In particular, ancillary interconnection services, provided through other interconnection interfaces and/or by other operators, at a point of interconnection are services that should be cost oriented. For this purpose, ANCOM intends to rely on bottom-up cost models.

In the first quarter of 2012, ANCOM with the assistance of TERA Consultants published the Conceptual Framework in which it specified how the costs of these services shall be assessed. ANCOM explained that it intends not to allocate any business overheads to Point of Interconnection services.

The goal of this document is to describe the bottom-up cost model used to calculate the cost of these services (called 'Point of Interconnection cost model' or 'PoI cost model') and the related assumptions and inputs. This document is a consultation document and reflects draft assumptions and opinions of ANCOM on the PoI cost model. Operators comments provided as an outcome of the consultation process will be considered and, if relevant, used to update the PoI cost model.

The document is divided into 3 sections:

- The first section lists the relevant ancillary interconnection services at stake (see section 1),
- The second section specifies the duration of the tasks necessary for providing these services and the unit costs used (see section 2),
- The last section details the efficient cost of providing the services (see section 3).

In the next paragraph, the key steps of the model are described.

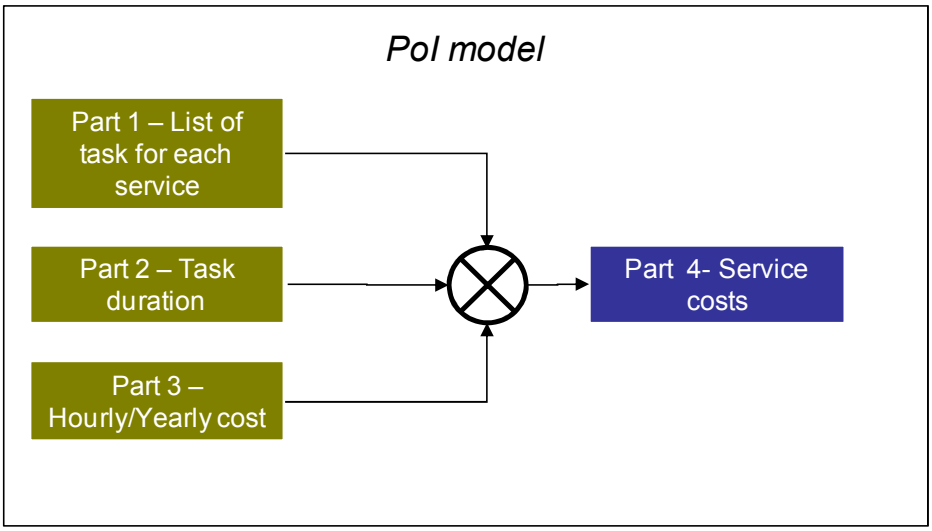
0.2 Steps of the PoI cost model

The provision of ancillary interconnection services involves costs for operators. Taking into account the underlying elements involved in the provision of these services and based on information provided by operators, it is observed that these costs are mainly

related to labour activities necessary for the provision of the services. As a consequence, the PoI model mainly estimates time required to carry out tasks (as provided by operators and assessed by experts) and multiply them by a hourly labour cost to obtain a cost for providing ancillary interconnection services. However, when equipments are necessary, they are added to the calculation.

These steps are detailed in the figure below:

Figure 1 - Steps of the PoI cost model



Source: TERA Consultants

0.3 Data provided by operators

In order to develop the PoI cost model, ANCOM and TERA Consultants issued a data request to operators asking them to detail the costs they incur for providing ancillary services and in particular to detail the tasks necessary to provide these services. Out of the six main fixed and mobile operators in Romania (RCS&RDS, Vodafone, Orange, UPC, Romtelecom, Cosmote), 4 responded. They generally provided:

- A description of the different tasks to be carried out for each ancillary service;
- The associated time required and type of employee involved for this task; and
- The average labour cost per hour related to each type of employee.

In annex of this report, a detailed list of data provided by operators is provided.

The model also uses inputs based on expert advice obtained by ANCOM and TERA Consultants. Where the ancillary service includes rental of network equipment, the model uses inputs from the fixed core model for some PSTN asset prices. These asset prices are also consistent with unit prices provided in the 2005 fixed core model developed by ANCOM.

The model is based on these data.

1 Ancillary interconnection services

1.1 List of services currently provided

The points of interconnection can have different configurations, depending on a series of particular circumstances. As a consequence, several ancillary interconnection services are necessary.

Currently, operators provide a range of ancillary services that is listed below. This table shows that operators do not provide exactly the same ancillary interconnection services (in grey services that are not provided by operators).

Figure 2 – List of ancillary interconnection services provided by operators in Romania

Type of service			Unit	VODAFONE	ORANGE	COSMOTE	RCS&RDS	ROMTELECOM	UPC
Configuration of partner in PoA/PoI			EUR/PoA	730	500	694	750	750	680
Reconfiguration of partner in PoA/PoI			EUR/PoA	730	500	694	750	750	680
Removal of partner in PoA/PoI			EUR/PoA	730	500	694	750	750	680
Installation of port in the switch			EUR/port of 2 Mbps	460	400	438	500	500	460
Reconfiguration of port in the switch			EUR/port of 2 Mbps	460	400	438			
Removal of port from the switch			EUR/port of 2 Mbps	460	400	438	150	150	460
Monthly rent of port in the switch		fixed switch	EUR/port of 2 Mbps/month	70	60	66	46	46	46
		mobile switch	EUR/port of 2 Mbps/month				70		
Other reconfiguration operations - for the 1st circuit			EUR/port of 2 Mbps		469	469	469	469	469
Other reconfiguration operations - for each of the other circuits in the same			EUR/port of 2 Mbps		67	67	67	67	67
Installation of transmission equipment		1 E1	EUR/equipment	2,300	1,500	2,192	1,000		1,800
		up to 4 E1	EUR/equipment				2,192		
Removal of transmission equipment			EUR/equipment	2,300	1,500	2,192	2,192		1,800
Installation of 2 Mbps interface			EUR/link of 2 Mbps	380	200	365	500	44	380
Reconfiguration of 2 Mbps interface			EUR/link of 2 Mbps	380	200	365	500		380
Removal of 2 Mbps interface			EUR/link of 2 Mbps	380	200	365	150		380
Leased line monthly fee	fixed part	<50km	EUR/link of 2 Mbps/month	315	390	482	315	44	420
		<50km - for PoI in NxData	EUR/link of 2 Mbps/month	270	270	292	270		280
		51-100km	EUR/link of 2 Mbps/month					522	
		101-150km	EUR/link of 2 Mbps/month		500			1,172	
		151-250km	EUR/link of 2 Mbps/month					1,416	
		>250km	EUR/link of 2 Mbps/month		4				
	variable part	<50km	Eur/link of 2 Mbps/km/month					23	
		<50km - for PoI in NxData	Eur/link of 2 Mbps/km/month						
		51-100km	Eur/link of 2 Mbps/km/month		-			12	
		101-150km	Eur/link of 2 Mbps/km/month		-			6	
		151-250km	Eur/link of 2 Mbps/km/month		-			4	
		>250km	Eur/link of 2 Mbps/km/month		4				
Installation of STM1 port			EUR/STM1 port	600					
Removal of STM1 port			EUR/STM1 port	600					
Installation of STM1 transmission equipment			EUR/STM1 equipment	5,000			2300		
Removal of STM1 transmission equipment			EUR/STM1 equipment	5,000					
Installation of STM1 interface			EUR/STM1	500					
Removal of STM1 interface			EUR/STM1	500					
STM1 monthly fee			EUR/STM1/month	7,900					
Capacity reservation			EUR/E1	200		250			
Increase of capacity order			EUR/E1	400	50% of the difference between ordered and planned	500			
Decrease of capacity order			EUR/E1	500	80% of the difference between planned and ordered	600		500	
Reconnect a suspended service			EUR/E1	350	150	320			
Connecting the equipments of 2 operators collocated in Romtelecom's spac			EUR/link of 2 Mbps					100	
Connecting the equipments of 2 operators collocated in Romtelecom's spac			EUR/link of 2 Mbps/month					0.06	
Administration fee for cascade payment in the transit arrangements			EUR/operator/month					73	

Source: TERA Consultants from ANCOM data

1.2 Relevance of services currently provided

Before assessing the cost of the different ancillary interconnection services, it is necessary to ensure that the list of ancillary interconnection services is not too

heterogeneous from an operator to another and to identify which services are relevant or not. As an outcome of the consultation process, Romanian operators will be in a position to clarify and objectively justify whether or not those services that are identified as not relevant should be removed.

There are 5 main “groups” of ancillary interconnection services which are described below: “configuration/reconfiguration/removal of Partner in PoI/PoA”, “installation, reconfiguration or removal of port in the switch”, “installation/removal of transmission equipment”, “installation/removal of 2Mbps interface” and “rental services” (port, interconnection links). There are however some additional services described after.

Each of the 42 service listed above is reviewed below:

- The service “configuration of Partner in PoI/PoA” is one of the key main services and is obviously necessary to enable operators to interconnect each other. “Reconfiguration of partner in PoA/PoI” and “Removal of partner in PoA/PoI” are from the same “family” of services and are also necessary in case of change of configuration or end of service being provided. In other words, because “configuration of Partner in PoI/PoA” is a necessary service, these two services are also necessary.
- Similarly, the “installation of a port in the switch”, its removal or its reconfiguration are necessary ancillary interconnection services. However, it does seem necessary to provide in addition to these services the following services “Installation of STM1 port”, “removal of STM1 port”:
    - Vodafone is the only operator which provides it and the price difference is limited to 30%;
    - It is not clear why the cost of installing or removing (not the cost of the port of course) would be very different for a standard port (E1). In particular, Vodafone did not provide any justification for it;
    - Finally, operators do not seem to order any STM1 ports.

  As a conclusion, the installation/removal of ports should be identical for E1 or STM1.
- The “monthly port of the switch” service is necessary to make sure the cost of ports and the related maintenance costs are recovered. However, the distinction between fixed and mobile should disappear and RCS&RDS is the only operator to provide such a distinction which does not appear to be justified from a cost point of view. This cost is indeed made of equipment costs and operating costs and, while switches may slightly differ between mobile and fixed networks, it is important to note first that the port installed in the switches are of same nature for fixed and mobile networks and should therefore not have different costs and second that operating costs, which account for the vast majority of costs for this service, have no reason for being different. This port can be either STM1 or E1.

- The “installation of transmission equipment” and “Removal of transmission equipment” services are necessary to make sure operators can install their equipment at the Point of Interconnection. However, these services are sub-divided by some operators and this does not seem to be justified:
    - For example, RCS&RDS is the only operator proposing a pricing differentiation between “Installation of a transmission equipment of E1 capacity” versus “Installation of transmission equipment above E1 and up to 4xE1 capacity”. However, no cost information has been provided and it does not seem that there are any significant cost differences between the installation of the two types of equipment.
    - Same for the “installation of STM1 transmission equipment” which is only proposed by Vodafone and Cosmote.
- The services “Installation of 2 Mbps interface”, “Reconfiguration of 2 Mbps interface” and “Removal of 2 Mbps interface” are necessary for the connection between the host operator and the hosted operator at the PoI. Vodafone also provides similar services with a STM1 interface but with higher prices. However, it is not justified why these services would take more time if the interface is STM1 and not E1. Therefore, for a STM1 interface, the cost should be the same as for a 2Mbps interface.
- All operators provide two other configuration services: “Other reconfiguration operations - for the 1st circuit” and “Other reconfiguration operations - for each of the other circuits in the same reconfiguration operation”, except Vodafone. These ancillary services are necessary for other circuit reconfiguration and have been reviewed by ANCOM during dispute resolution (NB: ports reconfiguration and 2Mbps/STM1 interface reconfigurations are already discussed above).
- The “capacity reservation” service is provided by 2 operators only. No cost information has been provided for this service by the 2 operators. This service does not seem to be necessary and it is not clear why operators would need to reserve capacity. Indeed, when operators need more interconnection capacity, then they need to send an order. The responding operator specifies then how and when this additional interconnection capacity will be provided. In particular, if there is not sufficient capacity, the provision of the service will take longer and the responding operator will need to order this capacity. This service can give incentives for some operators to pay for capacity reservation, even if they are very unlikely to make a firm order later and therefore to prevent another operator which really needs extra capacity and which has followed the normal process from having the required capacity. Instead of having this additional service, the provisioning process should simply require operators to specify when they plan to ask capacity (see next service) and provide the service on a “first in - first out” basis.

- "Unplanned capacity order" is a service that is normally applied when an increase in the capacity is ordered by the interconnection partner. This service prevents inefficient behaviours of other operators which are not planning sufficiently their demand and is therefore necessary. As the name of this service may be confusing, it is proposed to name it "increase of capacity".
- "Modification of capacity order" is also a relevant service in case an operator wants to reduce the capacity requested during the ordering process. As the name of this service may be confusing, it is proposed to name it "decrease of capacity".
- "Reconnect a suspended service" is also necessary if, for whatever reasons, the interconnection service is suspended and needs then to be re-established.

In addition to these services presented above, additional services are proposed by operators:

- The list of ancillary interconnection services includes also leased lines services. While the leased line services are clearly used as interconnection links, the costing of leased lines is carried out in the fixed core network cost model (with separate documentation), not in the PoI cost model.
    - Operators can either use their own infrastructure and or a leased line from Romtelecom, which is the most extensive network.
    - Considering the fact that leased lines used for interconnection should be relatively short (50 – 100 km – NB: only 2 operators provide leased lines above 50 km) and the fact that Romtelecom's prices are lower for these types of leased lines and available to any operator, it is proposed to align leased line prices to Romtelecom's prices (calculated in the fixed core network cost model).
- Romtelecom provides additional services: "Connecting the equipments of 2 operators collocated in Romtelecom's space" and "Connection fee Connecting the equipments of 2 operators collocated in Romtelecom's space - monthly fee" and "Administration fee for cascade payment in the transit arrangements". It is understood that it is only relevant for Romtelecom to provide these services as it is an operator managing a lot of interconnection agreements with other operators. This service seems necessary but it does not seem necessary to impose it to other operators.

No additional ancillary interconnection service has been stated as necessary by operators.

It should however be noted that maintaining the SS7 interconnection architecture inflates the costs of interconnection: interconnection on the basis of IP interface (used by small operators) should be much more cost effective.

1.3 Summary of ancillary interconnection services considered

Table 1 – List of relevant interconnection services

#	Ancillary interconnection service	Comment
1	Configuration of partner in PoA/PoI	*Includes material also*
2	Reconfiguration of partner in PoA/PoI	-
3	Removal of partner in PoA/PoI	-
4	Installation of port in the switch	*Includes material also*
5	Reconfiguration of port in the switch	-
6	Removal of port from the switch	-
7	Monthly rent of port in the switch	*Includes material also*
8	Other reconfiguration operations - for the 1st circuit	-
9	Other reconfiguration operations - for each of the other circuits in the same reconfiguration operation	-
10	Installation of transmission equipment	-
11	Removal of transmission equipment	-
12	Installation of 2 Mbps interface	-
13	Reconfiguration of 2 Mbps interface	-
14	Removal of 2 Mbps interface	-
15	Increase of capacity	-
16	Decrease of capacity	-
17	Reconnect a suspended service	-
18	Connecting the equipments of 2 operators collocated in Romtelecom's space - connection fee	*Romtelecom only*

19	Connecting the equipments of 2 operators collocated in Romtelecom's space - monthly fee	*Romtelecom only*
20	Administration fee for cascade payment in the transit arrangements	*Romtelecom only*
21	Leased Lines	*See Fixed core model*

Source: TERA Consultants

1.4 Typical tasks corresponding to the services

For some ancillary interconnection services, three operators have provided a detailed list of tasks that are necessary to implement these ancillary interconnection services. Operators provided very different types of tasks. Also, for some services, ANCOM issued some decisions in the past which are based on a list of task. ANCOM's decision no. 15/2011 and decision 244 of 2008 provide a list of tasks for the following services:

- installation of 2 Mbps interface (including removal of interface);
- other reconfiguration operations - for the 1st circuit;
- other reconfiguration operations - for each of the other circuits in the same reconfiguration operation.

However, typically, the following types of tasks are carried out (not for all services):

- Analyze request from the operator;
- Draft a solution;
- Agree between operators on the technical solution;
- Plan and carry out the configuration;
- Carry out network test;
- Carry out Billing tests.

As explained in section 0.2, the PoI cost model calculates the cost of ancillary interconnection services by multiplying the number of hours required to carry out tasks for the provision of the service by the hourly labour cost. While this is valid for the vast majority of services listed in table 1, this is not applicable for the following services:

- 7 - Monthly rent of port in the switch

- 19 - Connecting the equipments of 2 operators collocated in Romtelecom's space - monthly fee
- 20 - Administration fee for cascade payment in the transit arrangements
- 21 - Leased Lines

These services will be treated separately (see section 3).

2 Costing elements

As explained in Figure 1 - Steps of the PoI cost model, the time necessary to provide the ancillary interconnection services and the labour unit costs are key inputs to calculate the service costs. They are detailed below. A description of material costs involved is also proposed.

2.1 Time required to provide services

To provide a robust estimate of the time required to provide ancillary interconnection services, two parallel approaches have been followed:

1 A first approach which consists in collecting time estimates from operators and to compare them. This information is very important since it enables to understand and identify the tasks that are necessary to provide ancillary interconnection services. However, operators have provided sometimes very different estimates and have not provided similar levels of details. Also, some operators may have incentives to overestimate or underestimate these values. As a consequence, a concurrent approach is necessary.

2 A second approach where independent expert view is used in addition to ANCOM's past decisions. ANCOM and TERA Consultants have met 3 different independent experts who provided either time estimates or general guidance for estimating the time required to provide ancillary interconnection services. TERA Consultants and ANCOM have then produced their own estimates based on this information.

These two approaches are then compared and when operators' views give significantly different estimates than expert views, expert views have been preferred.

2.1.1 Operators' estimates

Here, the general approach for determining the efficient time required for providing ancillary interconnection services is to use the shortest time required amongst the different estimates provided by operators.

Considering that – to our knowledge - ancillary interconnection services should be provided with similar levels of quality amongst operators, using the shortest task duration will give incentives to operators to improve the efficiency of providing these services (which can be considered by operators has less important services than retail services for example). It will also enable to ensure that some operators are not paying for inefficiencies (such as bad organization) of other operators.

From a general point of view, it is to be noted that operators have sometimes provided similar durations for similar services while services can require less time. This has been considered in the assessment.

The results of the comparison of the time required to provide interconnection services provided by operators are listed in the table below.

Table 2 – Time necessary for providing ancillary interconnection services

#	Ancillary interconnection service	Duration provided (hours)	Comment
1	Configuration of partner in PoA/PoI	***32***-✂ -✂ -✂	*Shortest duration is selected. Two operators have provided similar durations (around 32)*
2	Reconfiguration of partner in PoA/PoI	***32***-✂	*Shortest duration is selected. The scope of work is similar to #1*
3	Removal of partner in PoA/PoI	***17***-✂	*The value of 17 is much more relevant as 32 because the work requested should be much smaller (the value of 32 is the same for #1, 2 and 3) while some tests are not required*
4	Installation of port in the switch	***6***-✂ -✂ -✂	*Shortest value seems abnormally low considering the tests that are required.*
5	Reconfiguration of port in the switch	***15***-✂	*Shortest is selected*
6	Removal of port from the switch	***14***-✂ -✂	*Shortest is selected. However, it is unlikely that removal takes as much time as installation. This is considered in the 2nd approach.*
7	Monthly rent of port in the switch	*TREATED SEPARATELY*	
8	Other reconfiguration operations - for the 1st circuit	***20***-✂	*Shortest is selected*
9	Other reconfiguration operations - for each of the other circuits in the same reconfiguration operation	***3*** – ✂	*Shortest is selected*
10	Installation of transmission equipment	***9***-✂ -✂	*Shortest is selected*
11	Removal of transmission equipment	***5***-✂ -✂	*Shortest is selected*

12	Installation of 2 Mbps interface	***7-✂***	*Shortest is selected*
13	Reconfiguration of 2 Mbps interface	***7-✂***	*Shortest is selected*
14	Removal of 2 Mbps interface	***5-✂***	*Shortest is selected*
15	Increase of capacity	✂	*Only one operator provided duration*
16	Decrease of capacity	***n/a***	*No operator provided durations*
17	Reconnect a suspended service	***5***	*Only one operator provided duration*
18	Connecting the equipments of 2 operators collocated in Romtelecom's space - connection fee	***23***	*Only one operator provided duration*
19	Connecting the equipments of 2 operators collocated in Romtelecom's space - monthly fee	*TREATED SEPARATELY*	
20	Administration fee for cascade payment in the transit arrangements	*TREATED SEPARATELY*	
21	Leased Lines	*TREATED SEPARATELY*	

Source: TERA Consultants

While the approach detailed above enables to ensure that only efficient task durations are considered, this approach needs to be complemented by further assessments. Indeed, sometimes, only one operator provided estimates for a given service, or durations provided are extremely heterogeneous. As a consequence, in order to verify whether the values selected above are relevant, a further assessment is carried out based on TERA's expertise and experts interviews.

2.1.2 Expert view

This assessment is based on the split of ancillary interconnection service provisions into tasks (provided by operators) and aims at calculating high level estimates of reasonable time required. This approach is conservative because assessing service duration by assessing duration of each task necessary to provide the service tends to inflate total duration.

The results of the assessment are presented in the table below and the details of assumptions are in annexes. It is based on expert views and/or ANCOM's past decisions. When making these assessments, it has been considered the fact that removal should be much quicker than installation and that an efficient operator should be able to run many tests automatically.

Table 3 – Time required to provide ancillary interconnection services based on TERA Consultants' expertise

#	Ancillary interconnection service	High level estimates of time required (hours rounded)
1	Configuration of partner in PoA/PoI	*23*
2	Reconfiguration of partner in PoA/PoI	*23*
3	Removal of partner in PoA/PoI	*7*
4	Installation of port in the switch	*12*
5	Reconfiguration of port in the switch	*11*
6	Removal of port from the switch	*3*
7	Monthly rent of port in the switch	*1*
8	Other reconfiguration operations - for the 1st circuit	*22*
9	Other reconfiguration operations - for each of the other circuits in the same reconfiguration operation	*3*
10	Installation of transmission equipment	*Not assessed*
11	Removal of transmission equipment	*Not assessed*
12	Installation of 2 Mbps interface	*4*
13	Reconfiguration of 2 Mbps interface	*3*

14	Removal of 2 Mbps interface	*1*
15	Increase of capacity	*18*
16	Decrease of capacity	*13*
17	Reconnect a suspended service	*Not assessed*
18	Connecting the equipments of 2 operators collocated in Romtelecom's space - connection fee	*6*
19	Connecting the equipments of 2 operators collocated in Romtelecom's space - monthly fee	*TREATED SEPARATELY*
20	Administration fee for cascade payment in the transit arrangements	*TREATED SEPARATELY*
21	Leased Lines	*TREATED SEPARATELY*

Source: TERA Consultants

NB: Only Romtelecom provided a level of details that allows a proper assessment. However, Romtelecom provided information only for a part of the services. This was complemented by past ANCOM's decisions for four services (services 8, 9, 12 and 14). For these four services, reconciliation was carried out between ANCOM's past decisions and Romtelecom's new submission. However, there were some discrepancies and in this case, ANCOM's past decisions have been considered. For other services, either the assessment was not carried out (services 10, 11 and 17), or the service was similar to another service and the assessment was based on this latter service (services 2, 3,5 and 13), or the duration was overestimated (service 15).

This assessment shows that for the majority of services, time required to provide services as calculated based on the minimum duration provided by operators is higher. For some, it is significantly lower (Installation of port in the switch, other reconfiguration operations - for each of the other circuits in the same reconfiguration operation).

The expert view is therefore preferred:

- Considering the fact that operators' submissions are greatly heterogeneous in terms of time duration and sometimes extremely unlikely but give interesting insights on the tasks that are necessary to provide services.
- Considering the fact that expert view is much more homogeneous and independent.

For the 3 following services, no detailed task list was provided by operators and therefore, durations directly provided by operators has been used (and considered as reasonable): Reconnect a suspended service, Installation of transmission equipment and Removal of transmission equipment.

2.2 Hourly labour cost

Three operators provided unit labour costs: Cosmote, Romtelecom and Vodafone.

Operators' unit labour costs vary from a role to another and also from an operator to another. They also appear abnormally high considering the average gross income in telecommunications & IT industry in Romania[1].

Considering these variations, two approaches have been considered to define a reasonable unit labour cost:

- The first approach consists in using the average unit labour cost provided by operators for each service. This assessment is carried out at the level of each service. For each service, operators have directly provided a mix of roles involved to provide the service. The main issues with this approach are the unrealistic labour costs and the fact that operators having provided very different mix of roles, results can be significantly different from one operator to another. For example, for the service "reconfiguration of port in the switch", the average unit labour cost varies from €11 per hour to €33 per hour. This difference can be explained by the fact that the mix of roles provided by some operators for a given service is also not realistic.
- The second approach consists first in defining an average unit labour cost for each role and second to define for each task used in the provision of a service the role involved. In this approach 3 different roles have been identified: role related to bureaucratic & paperwork[2], role related to technical & on site work[3] and network testing and analysis role[4]. For the first role, the average labour cost of €7 per hour specific to the telecommunications industry in Romania has been considered, while the costs of the other 2 roles have been uplifted by 20% and

[1] Average monthly gross income of 4015 lei in 2011 means an average labour cost of €7/hour http://www.insse.ro/cms/files/statistici/comunicate/com_anuale/costul%20fortei%20de%20munca/cfm11r.pdf

[2] Corresponds to P1 for RomTelecom and P3 for Cosmote

[3] Corresponds to P2 for RomTelecom and P2 for Cosmote

[4] Corresponds to P2 for RomTelecom and P4 for Cosmote

46%. Then, each task of each service has been categorised as either bureaucratic & paperwork, or technical & on site work or network testing and analysis. This approach gives more precision to the calculation and enables to have more consistent and more homogeneous results[5]. It does not depend on operators' mix of roles for each service.

Both approaches have been considered in the model but the second one is preferred as it enables to alleviate the strong discrepancies between data provided by operators as well as to consider more realistic labour costs specific to efficient service provision.

2.3 Material costs

One operator –Vodafone- provided also material costs for 6 of these services (other operators provided only time required):

- Configuration of partner in PoA/PoI (cost of the cable/patch between distribution frame and transmission equipment);
- Installation of port in the switch (cost of the cable/patch between distribution frame and transmission equipment);
- Removal of port from the switch (cost of the cable/patch between distribution frame and transmission equipment);
- Monthly rent of port in the switch (cost of the port);
- Installation of transmission equipment (fibre optic cables and STM cards);
- Removal of transmission equipment (fibre optic cables and STM cards).

Some of these material costs appear to be relevant and have been included in the calculation for the cost of the task, but some are not relevant:

- Cost of the cable/patch between distribution frame and transmission equipment is relevant and has been included for the services "Configuration of partner in PoA/PoI" and "Installation of port in the switch". Indeed, a short cable is required. The cost of such a cable, for 20 meters is around €12[6].
- Cost of the cable/patch between distribution frame and transmission equipment is not relevant for the service "Removal of port from the switch" because it is already paid by operators in the service "Installation of port in the switch". Including this cost twice would lead to cost over-recovery.

[5] The first approach could indeed lead to some inconsistencies because one service involving less time but similar tasks to another service could cost more than this latter service due to the inconsistency of data provided by operators.

[6] An operator provided a significantly higher value which does not appear realistic

- Monthly rent of port in the switch should include maintenance and depreciation of ports and depreciation of port costs and amounts to €49 per month for E1 and €62 per month for STM1:
    - Port costs are calculated for E1 and STM1 on the basis of unit costs and inputs of the 2005 fixed core network model developed by ANCOM (also used for the fixed core network cost model). They are depreciated over 12 years with a price trend of -5%, in accordance with the fixed core network cost model.
    - Maintenance and testing costs have been assessed assuming 1 hour per month are spent by one staff person.
- The "installation of transmission equipment" service is a service that consists for an operator to include its transmission equipment in a Point of Interconnection and then to use its transmission equipment to "forward" the traffic to its own network. The alternative to this service is the leased line service. As a consequence, the service “installation of transmission equipment” should not include any cost for transmission (fibre optics and STM cards) as these are either brought by the requesting operator itself or leased lines are ordered.
- Finally, the service “removal of transmission equipment” should not include any material cost for the same reasons as the service “installation of transmission equipment” and for the same reasons as the service “removal of port in the switch”.

The table below lists the material costs included for each ancillary interconnection service:

Table 4 – Material costs necessary for ancillary interconnection services

#	Ancillary interconnection service	Material costs proposed by operators	Material costs considered as relevant
1	Configuration of partner in PoA/PoI	*Cable/patch*	*Cable/patch*
2	Reconfiguration of partner in PoA/PoI	-	-
3	Removal of partner in PoA/PoI	*Cable/patch*	-
4	Installation of port in the switch	*Cable/patch*	*Cable/patch*
5	Reconfiguration of port in the switch	-	-
6	Removal of port from the switch	-	-
7	Monthly rent of port in the switch	*ports*	*ports*

8	Other reconfiguration operations - for the 1st circuit	-	-
9	Other reconfiguration operations - for each of the other circuits in the same reconfiguration operation	-	-
10	Installation of transmission equipment	*Fibre optics and transmission cards*	-
11	Removal of transmission equipment	*Fibre optics and transmission cards*	-
12	Installation of 2 Mbps interface		
13	Reconfiguration of 2 Mbps interface		
14	Removal of 2 Mbps interface	-	
15	Unplanned capacity order	-	-
16	Modification of capacity order	-	-
17	Reconnect a suspended service	-	-
18	Connecting the equipments of 2 operators collocated in Romtelecom's space - connection fee	-	-
19	Connecting the equipments of 2 operators collocated in Romtelecom's space - monthly fee	-	-
20	Administration fee for cascade payment in the transit arrangements	*TREATED SEPARATELY*	*TREATED SEPARATELY*
21	Leased Lines	*TREATED SEPARATELY*	*TREATED SEPARATELY*

Source: TERA Consultants

Four other services need to be “costed” separately:

- Leased lines costs are calculated in the fixed core model;
- Connecting the equipments of 2 operators collocated in Romtelecom's space - monthly fee is extremely low (6 €cts per month). It does not seem relevant to assess the rationale for the level of this cost. No cost data has been provided by Romtelecom;

- Administration fee for cascade payment in the transit arrangements have been reviewed by ANCOM in 2009 (decision 982 of 2009). This decision gives a 2009 cost of €73 for this ancillary interconnection service, which updated to 2012 circumstances results in €72/operator/month. This cost includes cost of new procedures, cost of bad debt and cost of software (which is the main update compared to 2009);
- Monthly rent of port in the switch should include maintenance and depreciation of ports and depreciation of port costs and amounts to €14 per month for E1 and €34 per month for STM1 (see section 2.3).

3 Main results

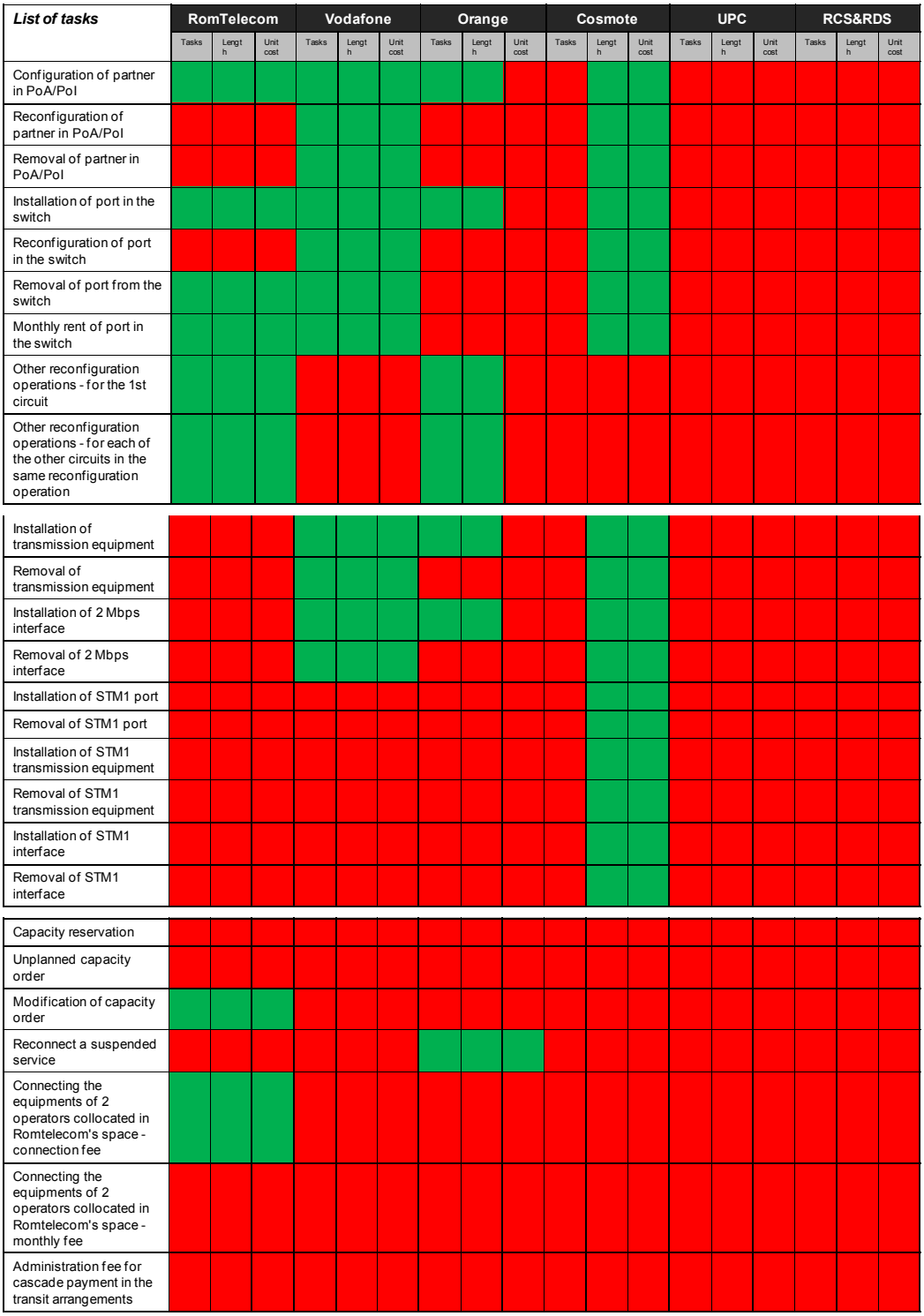
At this stage of the consultation process, the model results are not relevant.

As explained by ANCOM in the conceptual framework, overhead costs are not planned to be included on top of direct service costs.

4 Annex 1: Data provided by operators

The table below specifies for each ancillary interconnection service which type of data was provided by each operator:

Figure 3 – Type of data provided per ancillary interconnection service and per operator



Source : TERA Consultants

5 Annex 2: Assessment of time required to provide ancillary interconnection services

To assess the time required to provide ancillary interconnection services, it is necessary to split ancillary interconnection services into corresponding tasks. During the data collection process, ANCOM requested operators to provide a list of tasks to be carried out to provide ancillary interconnection services. Some operators provided such a list, with different level of details. One operator in particular provided a high level of details which split ancillary interconnection service provision into several elementary tasks. For some services, the list of task has been set considering past ANCOM's decision (see below).

Then, for these tasks, it is possible to assess the corresponding duration:

- By relying on ANCOM's previous decisions: decision no. 15/2011 and decision 244 of 2008 which give duration inputs for the following services:
  - Installation of 2 Mbps interface[7],
  - Removal of 2 Mbps interface[8],
  - Other reconfiguration operations - for the 1st circuit,
  - Other reconfiguration operations - for each of the other circuits in the same reconfiguration operation.
- By using expert opinions. Three different experts have been interviewed on this subject (two Romanian which mainly gave indications on tests, one in UK). Expert opinion has been also used to review the duration of interoperability tests that was assumed in ANCOM's previous decision on Other reconfiguration operations - for the 1st circuit and Other reconfiguration operations - for each of the other circuits in the same reconfiguration operation services;
- By using reasonable estimates for basic tasks for which durations provided by operators do not seem reasonable. Some of these basic tasks have been based on the 2010 access network cost model developed by ANCOM such as the tasks consisting in forwarding information from an operator department to another department or updating a database;
- By using data provided by operators for tasks that are very specific and therefore for which task duration cannot be assessed without the data from operators.

To carry out this assessment, following facts have been taken into accounts:

[7] Spreadsheet "Input_One-off_fees" of the 2010 access network cost model gives durations for the service "OAL - Collocation - 2Mbit/s". The duration for the provision of the connection service is ✂ hours

[8] Spreadsheet "Input_One-off_fees" of the 2010 access network cost model gives durations for the service "OAL - Collocation - 2Mbit/s". The duration for the provision of the disconnection service is ✂ hours

- "removal" services require less time than "installation" services. They are generally performed under a software interface where the equipment is shut down (for example, "removal of partner in PoA/PoI" and "removal of port in the switch", where the port stays on the switch).
- For the preparation of a solution for the service "configuration of partner in PoA/PoI", operators have already indicated their PoA/PoI where interconnection is possible and the solution are in principle pre-defined by the large operators. There's not much room to design unique solutions from scratch.
- For tests related to the service "configuration of partner in PoA/PoI", they are run automatically. 3 types of tests are carried out: access related, softswitch tests and billing (numbering, policies, rules. etc). Some of them can be performed simultaneously (softswitch & billing). However, it is to be noted that, if the precise equipment settings are clearly indicated in the technical appendixes to the interconnection contract, there is no need to carry out softswitch tests. Configuration tests should normally take 3-4 hours. Billing tests should take 2 hours[9].
- Also, when a test is carried out, if it lasts x hours, engineers do not need to spend x hours testing but can perform other tasks in parallel. As a consequence, a percentage of 50% is applied to test durations to reflect time spent by engineers.
- For testing ports, this should take less than one hour as most of the tests have already been performed under configuration of PoA/PoI.
- Physical connections should not last more than 1 hour.

The following table summarizes and lists the assumptions taken to assess the time required for each elementary task identified.

Figure 4 – Assumptions used for tasks duration

Tasks	Duration assumption (minutes)
Sending information	10
Preparing a draft solution	120
Reviewing the solution	60
Paperwork (work orders, etc.)	60
Updating an IT system or database or updating it	15
Testing port	60
Realising a physical connection	60
Carrying out tests and analysing tests	120
Installing interface	20
Configuring and testing interface	184
Interface uninstallation	45
Implementing OLO numbering and services	60
Technical department perform work order to unblock technical solution	120
Technical department monitor the routed traffic from OLO	210
Billing tests	120
Reconfiguration activities for switching resources	150
Testing and maintaining the port (minutes per one month)	60

[9] ANCOM's decision 244 of 2008 gives a duration for billing tests of 3 hours ('checking the billing' and ' analysing the tests results')

Source: TERA Consultants

Tables below detail the estimates per service:

Figure 5 – Time required per service as assessed by TERA Consultants

Type of service	Unit	Time spent
Configuration of partner in PoA/PoI		**23.3**
Requested information from OLO		
1. Wholesale department sends OLO request to technical department	Minutes	10.0
2. Technical departament analyse request, issues draft solution based on actual tech	Minutes	120.0
3. Technical department sends draft solutions to Wholesale department (together wit	Minutes	10.0
4. Wholesale department informs OLO and request additional information (signaling ,	Minutes	10.0
5. Wholesale department sent additional information from OLO to technical departmer	Minutes	10.0
6. Technical departament verifies additional request & issues final proposed technical	Minutes	60.0
7. Technical department sends final proposed technical solutions to Wholesale depa	Minutes	10.0
8. Wholesale department informs OLO and requests confirmation for final proposed te	Minutes	10.0
Planning of final technical solution		
1. Technical department verify availablility of resources (switching, transmission, infra	Minutes	15.0
2. Technical department perform Data/Digital Line request (paperwork)	Minutes	60.0
3. Technical department perform reconfiguration activities for switching resources (DLI	Minutes	150.0
4. Technical department perform technical solution file	Minutes	60.0
5. Update of technical database	Minutes	15.0
Network configuration		
1. Technical department perform physical connections for signaling circuits	Minutes	60.0
2. Technical department perform software update for signalling circuits (create new rc	Minutes	15.0
3. Technical department perform the connection of 2 Mbps links	Minutes	60.0
4. Technical department configure the voice network (voice routes, voice instalment)	Minutes	15.0
5. Technical department implement OLO numbering and services	Minutes	60.0
Network configuration tests		
1. Technical department plan required technical test & validate the schedule with OLC	Minutes	30.0
2. Technical department carry out tests	Minutes	120.0
3. Wholesale department inform OLO & request confirmation	Minutes	10.0
4. Wholesale department sent OLO confirmation to technical department	Minutes	10.0
5. Technical department block agreed resources for interconnection with OLO	Minutes	10.0
Acceptance/Implementation on technical solution		
1. Wholesale department implements interconnection agreements in the billing softwa	Minutes	15.0
2. Wholesale department performs billing tests and sends request to unblock the tecl	Minutes	120.0
3. Technical department perform OS to unblock technical solution	Minutes	120.0
4. Technical department monitor the routed traffic from OLO	Minutes	210.0
TOTAL HOURS	Hours	**23.3**
Reconfiguration of partner in PoA/PoI		**23.3**
Same as above	Minutes	1,395.0
TOTAL HOURS	Hours	**23.3**
Removal of partner in PoA/PoI		**6.7**
Requested information from OLO		
1. Wholesale department sends OLO request to technical department	Minutes	10.0
Planning of final technical solution		
1. Update of technical database	Minutes	15.0
Network configuration	Minutes	120.0
Acceptance/Implementation on technical solution	Minutes	255.0
TOTAL HOURS	Hours	**6.7**
Installation of port in the switch		**12.5**
Analysis of requested information from OLO		
1. Wholesale department sends OLO request to technical department	Minutes	10.0
2. Technical departament verifies request & check available resources at switch level	Minutes	15.0
3. Technical department perform Data/Digital Line request (paperwork)	Minutes	60.0
4. Technical department perform reconfiguration activities for switching resources (DL	Minutes	15.0
5. Update of technical database	Minutes	15.0
6. Technical department perform the connection of 2 Mbps links	Minutes	60.0
7. Technical department configure the voice network (voice routes, voice instalment)	Minutes	15.0
Network configuration tests		
1. Technical department perform testing (level 1) - traffic tests, signalling tests etc (ir	Minutes	60.0
2. Wholesale department inform OLO & request confirmation	Minutes	10.0
3. Wholesale department sent OLO confirmation to technical department	Minutes	10.0
4. technical department block agreed resources for interconnection with OLO	Minutes	15.0
Acceptance/Implementation on technical solution		
1. Wholesale department implements interconnection agreements in the billing softwa	Minutes	15.0
2. Wholesale department performs billing tests and sends request to unblock the tecl	Minutes	120.0
3. Technical department perform OS to unblock technical solution	Minutes	120.0
4. Technical depatment monitor the routed traffic from OLO	Minutes	210.0
TOTAL HOURS	Hours	**12.5**
Reconfiguration of port in the switch		**11.5**
Same as above without connection	Minutes	690.0
TOTAL HOURS	Hours	**11.5**
Removal of port from the switch		**3.3**
1. Wholesale department sends OLO request to technical department	Minutes	10.0
2. Technical department perform work order and Data/Digital Line request (paperwork)	Minutes	60.0
3. Update of technical database	Minutes	15.0
4. Technical department eliminate the connection of 2 Mbps links (incl software chai	Minutes	60.0
5. Technical department configure the removal of voice network (voice routes, voice ir	Minutes	15.0
6. Technical department informs Wholesale department about removal of ports	Minutes	10.0
7. Wholesale department inform OLO & request confirmation	Minutes	10.0
8. Wholesale department implements interconnection agreements in the billing softwa	Minutes	15.0
TOTAL HOURS	Hours	**3.3**

Monthly rent of port in the switch		**1.0**
1.Testing and maintaining the port (minutes per one month)	Minutes	60.0
TOTAL HOURS	Hours	**1.0**
Other reconfiguration operations - for the 1st circuit		**22.0**
Analysis of requested information from OLO		
1. Agreement of the plan with OLO: defining the testing configuration, the set of tests,	Minutes	120.0
2. Development of the technical interconnection solution	Minutes	180.0
3. Reservation of resources	Minutes	60.0
4. Setting the technical solution for transmission	Minutes	60.0
Network configuration tests		
1. Setting-up the testing configuration in Romtelecom's network (voice circuits, introdu	Minutes	90.0
2. Changes in the database in the switching network of Romtelecom	Minutes	300.0
3. Interoperability tests excluding billing and issuing the interoperability test certificate	Minutes	120.0
Acceptance/Implementation on technical solution		
1. Changes in the billing systems in order to introduce the new voice circuits	Minutes	120.0
2. Billing tests and results analysis	Minutes	120.0
3. Activation of the new routes and destination codes in the elements of Romtelecom'	Minutes	60.0
4. Activation of the new signalling link-set and changing signalling routing for the traffi	Minutes	30.0
5. Moving (re-orientation) of the commercial traffic on the new PAs in OLO's network t	Minutes	30.0
6. Deleting the elements corresponding to voice and signalling links that are re-oriente	Minutes	30.0
TOTAL HOURS	Hours	**22.0**
Other reconfiguration operations - for each of the other circuits in the same reconfiguration operation		**2.9**
Analysis of requested information from OLO		
1. Wholesale department sends OLO request to technical department	Minutes	10.0
Network configuration tests		
1. Setting-up the testing configuration in Romtelecom's network - define CICs on new	Minutes	15.0
2. Changes in the database and in the switching network of Romtelecom	Minutes	30.0
3. Interoperability tests excluding billing (transmission only)	Minutes	120.0
TOTAL HOURS	Hours	**2.9**
Installation of transmission equipment		
No detailed tasks available and consistent		
Removal of transmission equipment		
No detailed tasks available and consistent		
Installation of 2 Mbps interface		**3.7**
1. Wholesale department request configuration to technical departments	Minutes	10.0
2. Interface installation in existing equipment / Identify technical availability on equip	Minutes	20.0
3. 2Mbps interface configuration and testing	Minutes	184.0
4. Technical department sends wholesale the results and to the OLO	Minutes	10.0
TOTAL HOURS	Hours	**3.7**
Reconfiguration of 2 Mbps interface		**3.4**
1. Wholesale department request configuration to technical departments	Minutes	10.0
2. Interface reconfiguration and testing	Minutes	184.0
4. Technical department sends wholesale the results and to the OLO	Minutes	10.0
TOTAL HOURS	Hours	**3.4**
Removal of 2 Mbps interface		**1.3**
1. Wholesale department request configuration to technical departments	Minutes	10.0
2. Interface uninstallation in existing equipment	Minutes	45.0
3. Update of technical database		15.0
4. Technical department sends wholesale the results and to the OLO	Minutes	10.0
TOTAL HOURS	Hours	**1.3**

Increase of capacity order			**18.3**
Analysis of requested information from OLO			
1. Wholesale department sends OLO request to technical department	Minutes		10.0
2. Technical departament verifies request & check available resources (switching, tra	Minutes		15.0
3. Technical department perform work order and Data/Digital Line request (paperwork	Minutes		60.0
3. Technical department perform reconfiguration activities for switching resources (DL	Minutes		150.0
5. Update of technical database	Minutes		15.0
Network configuration			
1. Technical department perform physical connections for signaling circuits	Minutes		60.0
2. Technical department perform software update for signalling circuits (create new rc	Minutes		15.0
3. Technical department perform the connection of 2 Mbps links	Minutes		60.0
4. Technical department configure the voice network (voice routes, voice instalment)	Minutes		15.0
5. Technical department implement OLO numbering and services	Minutes		60.0
Network configuration tests			
1. Technical department plan required technical test & validate the schedule with OLC	Minutes		10.0
2. Technical department perform tests and anlysing tests	Minutes		120.0
3. Wholesale department inform OLO & request confirmation	Minutes		10.0
4. Wholesale department sent OLO confirmation to technical department	Minutes		10.0
5. Technical department block agreed resources for interconnection with OLO	Minutes		15.0
6. Technical department inform Wholesale department about modification of capacity	Minutes		10.0
Acceptance/Implementation on technical solution			
1. Wholesale department implements interconnection agreements in the billing softwa	Minutes		15.0
2. Wholesale department request IT billing confirmation and sends request to unblock	Minutes		120.0
3. Technical department perform OS to unblock technical solution	Minutes		120.0
4. Technical department monitor the routed traffic from OLO	Minutes		210.0
TOTAL HOURS	Hours		**18.3**
Decrease of capacity order			**12.7**
Analysis of requested information from OLO			
1. Wholesale department sends OLO request to technical department	Minutes		10.0
2. Technical department perform reconfiguration activities for switching resources (DL	Minutes		150.0
3. Update of technical database	Minutes		15.0
Network configuration			
1. Technical department perform physical disconnections for signaling circuits	Minutes		60.0
3. Technical department perform the disconnection of 2 Mbps links	Minutes		60.0
Acceptance/Implementation on technical solution			
1. Wholesale department implements interconnection agreements in the billing softwa	Minutes		15.0
2. Wholesale department request IT billing confirmation and sends request to unblock	Minutes		120.0
3. Technical department perform OS to unblock technical solution	Minutes		120.0
4. Technical department monitor the routed traffic from OLO	Minutes		210.0
TOTAL HOURS	Hours		**12.7**
Reconnect a suspended service			
No detailed tasks available			
Connecting the equipments of 2 operators collocated in Romtelecom's space - connection fee			**7.1**
Analysis of requested information from OLO			
1. Wholesale department sends OLO request to technical department	Minutes		10.0
2. Technical department perform work order and Data/Digital Line request (paperwork)	Minutes		60.0
3. Technical department perform technical solution file	Minutes		60.0
4. Update of technical database	Minutes		15.0
Network configuration			
1. Technical department perform physical connections for signaling circuits	Minutes		60.0
2. Technical department perform software update for signalling circuits (create new rc	Minutes		15.0
3. Technical department perform the connection of 2 Mbps links	Minutes		60.0
4. Technical department configure the voice network (voice routes, voice instalment)	Minutes		15.0
Network configuration tests			
1. Technical department perform compatibility tests and analyse tests	Minutes		120.0
2. Wholesale department inform OLO & request confirmation	Minutes		10.0
TOTAL HOURS	Hours		**7.1**

Source : TERA Consultants

6 List of tables and figures

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