



COMMERCE COMMISSION

**STANDARD TERMS DETERMINATION FOR
CHORUS' UNBUNDLED BITSTREAM ACCESS
BACKHAUL SERVICE**

**SCHEDULE 3
UBA BACKHAUL SERVICE LEVEL TERMS
PUBLIC VERSION**

Updated to incorporate Commerce Commission decisions, amendments, and clarifications through
17 May 2012

Determination version history		
Determination date	Decision number	Determination name
27 June 2008	627	Standard Terms Determination for the designated service Chorus' unbundled bitstream access backhaul
5 March 2009	665	Clarification of the Standard Terms Determinations on Telecom's Unbundled Copper Local Loop Network Backhaul (Telephone Exchange to Interconnection Point) Service and Unbundled Bitstream Access Backhaul Service
24 November 2011	740	Consequential Changes to Commerce Commission Standard Terms Determinations
17 May 2012	2012 NZCC 12	Clarification of the UBA and UBA Backhaul Standard Terms Determinations 2012

Table of contents

1	Introduction.....	1
2	Scope.....	2
3	Service Levels.....	3
4	Exclusions.....	3
5	Access Seeker Forecasts	4
6	Reporting on Service Levels	4
7	Service Levels Defaults.....	4
8	Performance Penalties	4
9	Reconciliation of Performance Penalties	5
Appendix 1.....		6
	Provision of UBA Backhaul Service	6
	Fault Management for UBA Backhaul Service.....	10
Appendix 2.....		12
	Operational Support System SLAs for UBA Backhaul Service	12
Appendix 3.....		13
	Performance Penalties	13
Appendix 4.....		16
	Standard Lead-Times for Orders	16

1 Introduction

- 1.1 These Service Level Terms (**SLA**) are part of the UBA Backhaul Terms, which set out the rights and obligations of Chorus and Access Seekers in relation to Chorus' UBA Backhaul Service.
- 1.2 The operational requirements for the UBA Backhaul Service are set out in the UBA Backhaul Operations Manual.
- 1.3 References to clauses or sections are references to clauses and sections of this SLA unless stated otherwise. The definitions set out in the UBA Backhaul General Terms and the UBA Backhaul Operations Manual apply to the extent that they are not expressly modified by or inconsistent with the context of this SLA. The definitions set out in clause 1.4 apply to this SLA.

1.4 Definitions

Deemed Acceptance Time	means the time which is four Business Hours after the Receipt Time of a valid Order. To avoid doubt, an Order may still be rejected notwithstanding a deemed acceptance.
Deliverable	means a Level A Deliverable or a Level B Deliverable.
Determination Date	means the date on which the UBA Backhaul Standard Terms Determination comes into force.
Future Service Level Deliverable	means any Deliverable that is added to this SLA in accordance with the change mechanism set out in section 9 of the UBA Backhaul General Terms.
Future Service Levels	means the way in which Chorus' performance of a Future Service Level Deliverable will be measured.
Half Contract Year	means a six month period ending on 31 March and a six month period ending on 30 September.
Level A Deliverables	means those deliverables performed by Chorus pursuant to this SLA for which failure by Chorus may cause the Access Seeker diminished service quality in providing services to its End Users, as set out in Appendix 1 and Appendix 2.
Level A Service Level	means the way in which Chorus' performance of a Level A Deliverable is measured (except as may be otherwise provided) on a monthly basis, as set out in Appendix 1 and Appendix 2. A Level A Service Level is subject to any exclusions specified in this SLA.
Level A Service Level Default	means a failure by Chorus to meet the Level A Service Level corresponding to a particular Level A Deliverable.
Level B Deliverables	means those deliverables performed by Chorus pursuant to this SLA for which failure by Chorus is unlikely to cause the Access Seeker diminished service quality in providing services to its End Users, as set out in Appendix 1 and Appendix 2.
Level B Service Level	means the way which Chorus' performance of a Level B Deliverable is measured (except as may be otherwise provided) on a monthly basis, as set out in Appendix 1 and Appendix 2. A Level B Service Level is subject

to any exclusions specified in this SLA.

Level B Service Level Default	means a failure by Chorus to meet the Level B Service Level corresponding to a particular Level B Deliverable.
Penalty Rate	means the percentage used in the calculation of Performance Penalties, as described under the "Calculation of Penalty Rate" section set out in Appendix 3.
Performance Penalty	means the amount that an Access Seeker is entitled to claim in the event of a Level A Service Level Default, calculated in accordance with section 8 and Appendix 3.
Receipt Time	<p>means:</p> <p>(a) for Orders that are made using the OO&T system, the time that the electronic communication containing the Order enters the OO&T system; or</p> <p>(b) for Orders that are made by email, the time that an Order is received in the Chorus designated inbox for receipt of such Orders,</p> <p>provided that where an Order is received outside Business Hours, the Receipt Time will be the start of the first Business Hour of the following Working Day.</p>
Service Levels	means, collectively, Level A Service Levels and Level B Service Levels.
Service Level Default	means a Level A Service Level Default or a Level B Service Level Default.
Specified Date	means, in respect of Future Service Levels, the date approved by the Commission under the change mechanism set out in section 9 of the UBA Backhaul General Terms.
Standard Lead-Time	means the time period that it will take Chorus to provision a UBA Backhaul Service as set out in Appendix 4.
Tolerance Level	means minimum acceptable levels of performance of a Service Level for a Deliverable, expressed as a percentage, in Appendix 1 and Appendix 2.

2 Scope

- 2.1 This SLA:
- 2.1.1 sets out the quality and performance of the Service Level commitments of Chorus to the Access Seeker for the delivery of the UBA Backhaul Service; and
 - 2.1.2 provides for a penalty mechanism where Chorus fails to meet its Service Levels.
- 2.2 This SLA may be changed in accordance with the change mechanism set out in section 9 of the UBA Backhaul General Terms.

- 2.3 Chorus will review this SLA 12 months after the Determination Date and thereafter every second year on 1 November (or earlier if requested by the Access Seeker and an earlier review is agreed to by Chorus). The change mechanism set out in section 9 of the UBA Backhaul General Terms will apply to any changes proposed by Chorus as a result of any review.

3 Service Levels

- 3.1 Chorus will provide the Deliverables in accordance with this SLA.
- 3.2 The Service Levels set out in Appendix 1 apply from the Determination Date.
- 3.3 The Service Levels set out in Appendix 2 apply from the date that is 95 Working Days after the Determination Date.
- 3.4 Any Future Service Levels will apply from the Specified Date.
- 3.5 The nature of any Future Service Levels, including their respective Tolerance Levels, will be set in accordance with the change mechanism set out in section 9 of the UBA Backhaul General Terms.
- 3.6 If the Access Seeker updates or changes an Order under clause 9.10 of the UBA Backhaul Operations Manual, the Service Levels applicable to that Order (as updated or changed) will be measured from the date that update or change was made by Chorus.

4 Exclusions

- 4.1 The Service Levels will not apply where:
- 4.1.1 a Service Level Default is due to a Force Majeure Event;
 - 4.1.2 a Service Level Default is a direct result of an Access Seeker failing to comply with an express obligation under the UBA Backhaul Terms;
 - 4.1.3 it is expressly so stated in the UBA Backhaul Operations Manual or the UBA Backhaul General Terms;
 - 4.1.4 a Service Level Default is a direct result of:
 - (a) a fault that is the Access Seeker's responsibility under the UBA Backhaul General Terms; or
 - (b) anything (including any fault) caused by the telecommunications network or equipment of any third party or the Access Seeker's Network or the Access Seeker's Equipment;
 - 4.1.5 a fault is reported and no fault for which Chorus is responsible is detected when the service is tested from end to end;
 - 4.1.6 a Service Level Default is due to a failure by the Access Seeker or its End User to allow access to the premises or equipment when reasonably requested;
 - 4.1.7 remedying a Service Level Default would result in a material health and safety risk for a Chorus employee or agent, the avoidance of which could not have been realistically predicted by Chorus; or
 - 4.1.8 agreed between Chorus and the Access Seeker.

- 4.2 Further exclusions or limitations to Chorus' liability in respect of specific Service Levels are set out in Appendix 1 and Appendix 2. The exclusions and limitations provided in Appendix 1 and Appendix 2 are in addition to the general exclusions set out in this section 4 and in no way limit the exclusions set out in this section 4.
- 4.3 Where Chorus makes a decision that a Service Level Default has not occurred because one or more of the exclusions apply, the details of the exclusion are to be recorded and reported in Chorus' monthly performance report provided in accordance with clause 6.1.

5 Access Seeker Forecasts

- 5.1 The Access Seeker will provide BAU Forecasts to Chorus in accordance with the procedures and time frames set out in the UBA Backhaul Operations Manual. The consequences of the Access Seeker failing to provide BAU Forecasts or failing to provide accurate BAU Forecasts will be as set out in clauses 7.1.5 and 7.4 of the UBA Backhaul Operations Manual.

6 Reporting on Service Levels

- 6.1 Chorus will provide the Access Seeker and the Commission with a performance report each month. The report will be delivered or made available to the Access Seeker and Commission within 10 Working Days of the end of each calendar month in both hard-copy and electronic format. The report will detail Chorus performance and compliance with each of the Service Levels over the preceding month. The format and content of the performance report will be proposed by Chorus within 10 Working Days of the Determination Date for approval by the Commission.
- 6.2 The performance report provided in accordance with clause 6.1 must be made publicly available on a Chorus website accessible by the Commission and all Access Seekers.

7 Service Levels Defaults

- 7.1 In the event of a Service Level Default, Chorus will provide a report to the Access Seeker and the Commission detailing:
- 7.1.1 the cause of and procedure for correcting such Service Level Default;
 - 7.1.2 the steps taken by Chorus to remedy the Service Level Default and the effectiveness of those steps; and
 - 7.1.3 any previous Service Level Defaults in respect of that Deliverable occurring during the current and preceding Half Contract Year.
- The report will be provided each month until the Service Level Default is remedied, at the same time as Chorus provides its report under clause 6.1.
- 7.2 The report provided in accordance with clause 7.1 must be made publicly available on a Chorus website at the same time as it is provided to the Access Seeker and the Commission.

8 Performance Penalties

- 8.1 Subject to section 4, in the event of a Level A Service Level Default, the Access Seeker will receive a Performance Penalty from Chorus. The Performance Penalty will be that set out in Appendix 3.

8.2 Notwithstanding clause 8.1, the Access Seeker will not be entitled to receive Performance Penalties for a Level A Service Level Default relating to:

- (a) the Service Level set out at item 6 of Appendix 1 – where the Level A Service Level Default occurs at any time during the 210 Working Days immediately following the Determination Date;
- (b) the Service Level set out at item 7 of Appendix 1 – where the Level A Service Level Default occurs at any time during the 210 Working Days immediately following the Determination Date; and
- (c) the Service Level set out at item 14 of Appendix 1 – where the Level A Service Level Default occurs at any time during the 210 Working Days immediately following the Determination Date.

9 Reconciliation of Performance Penalties

9.1 Within 10 Working Days after the end of each calendar month (the **Relevant Month**), Chorus will provide a summary report to the Access Seeker that will detail the total amount of Performance Penalties imposed for Service Level Defaults in accordance with section 8 during the Relevant Month, detailed by Service Level.

9.2 Where the Access Seeker is entitled to receive payment of a Performance Penalty from Chorus, Chorus will set off the total amount of the Performance Penalties from the Charges due in the next invoice issued by Chorus to the Access Seeker in relation to the UBA Backhaul Service. If the Performance Penalties exceed the Charges due, then Chorus must pay the amount equivalent to the Performance Penalty, or that part of the Performance Penalty not so set off, to the Access Seeker within 20 Working Days of the end of the Relevant Month.

9.3 Within 10 Working Days after the end of each Half Contract Year, Chorus will provide a summary report to the Access Seeker that will include the following:

9.3.1 with respect to each Deliverable for which there was a Service Level Default during the preceding Half Contract Year:

- (a) statistics on Chorus' average monthly performance of that Deliverable, detailed by month, during that Half Contract Year; and
- (b) the average of Chorus' average monthly performance of that Deliverable during that Half Contract Year;

9.3.2 the total amount of Performance Penalties imposed for Service Level Defaults in accordance with section 8, detailed by calendar month, during the preceding Half Contract Year.

9.4 Any Performance Penalty imposed under the provisions of this SLA is credited on the basis that there is:

9.4.1 no admission of liability by Chorus or the Access Seeker; and

9.4.2 that any amount credited will be credited without prejudice to any right of either Chorus or the Access Seeker to claim for additional loss resulting from the Service Level Default.

Appendix 1

Provision of UBA Backhaul Service

Item No.	Level A / Level B	Services to which Service Level relates	Service Attribute	Deliverable	Service Level	Tolerance Level	Exclusions
1.	Level B	New Connection Relinquishment Speed Change Network Change Handover Link	Order acknowledgement	Chorus will acknowledge receipt of an Order	Provide acknowledgment to the Access Seeker within 4 Business Hours following the Receipt Time	99%	
2.	Level B	New Connection Relinquishment Speed Change Network Change Handover Link	Notification of rejection	Chorus will reject an invalid Order by returning the appropriate code to the Access Seeker	Provide notification of the rejection to the Access Seeker within 8 Business Hours following the Receipt Time	90%	
3.	Level B	New Connection Relinquishment Network Change Handover Link Speed Change (requiring Truck Roll)	Notification of expected RFS date for an Order	Chorus will notify the Access Seeker of expected RFS date of the Order ¹	Provide notification of the expected RFS date to the Access Seeker within 7 Working Days of the Deemed Acceptance Time	90%	

¹

The notified expected RFS Date must be within the Standard Lead-Time, except where otherwise agreed between Chorus and the Access Seeker.

Item No.	Level A / Level B	Services to which Service Level relates	Service Attribute	Deliverable	Service Level	Tolerance Level	Exclusions
4.	Level B	Speed Change (no Truck Roll)	Notification of expected RFS date for a Speed Change Order	Chorus will notify the Access Seeker of the expected RFS date of the Speed Change Order (where no Truck Roll is required) ²	Provide notification of the expected RFS date to the Access Seeker within 3 Working Days of the Deemed Acceptance Time	90%	
5.	Level B	New Connection Relinquishment Speed Change Network Change Handover Link	Change to RFS date	Chorus will notify the Access Seeker of a change of RFS date	Provide notification of the change of RFS Date to the Access Seeker within 3 Working Days of receipt of the request to change an existing Order (provided that the request is received at least 1 Working Day prior to the notified RFS Date)	90%	

²

The notified expected RFS Date must be within the Standard Lead-Time, except where otherwise agreed between Chorus and the Access Seeker.

Item No.	Level A / Level B	Services to which Service Level relates	Service Attribute	Deliverable	Service Level	Tolerance Level	Exclusions
6.	Level A	New Connection Relinquishment Speed Change Network Change Handover Link	Order is completed right first time	Chorus will complete the Order without fault	No faults in work carried out to provision the Order to occur within 5 Working Days of confirmation of completion of the Order by Chorus	90% (for each service)	The fault must be a fault: (a) for which Chorus is responsible; and (b) that has been reported to Chorus within five Working Days of confirmation of completion of the Order by Chorus; and (c) that is found and required to be fixed. (It is not a 'No Fault Found')
7.	Level A	New Connection Speed Change Network Change Handover Link	Meet notified expected Chorus RFS date	Chorus will complete the Order by the notified expected RFS date	Complete the Order by the notified expected RFS date	90% (for each service)	
8.	Level B	Relinquishment	Meet notified expected Chorus RFS date	Chorus will complete the Order by the notified expected RFS date	Complete the Order by the notified expected RFS date	90%	

Item No.	Level A / Level B	Services to which Service Level relates	Service Attribute	Deliverable	Service Level	Tolerance Level	Exclusions
9.	Level B	New Connection Relinquishment Speed Change Network Change Handover Link	Confirmation of completion	Chorus will provide confirmation of completion	Chorus will provide confirmation of completion of Order to the Access Seeker within 4 Business Hours of completing the Order	90%	
10.	Level B	UBA Backhaul Service	Notification of Planned Outages	Chorus will advise of Planned Outages	Advise at least 5 Working Days before Planned Outage occurs	90%	Chorus will use its all reasonable endeavours to schedule Planned Outages between the hours of 11:00pm and 6:00am
11.	Level B	UBA Backhaul Service	Notification of Unplanned Outages	Chorus will advise of Unplanned Outages	Advise within 2 hours, 24 hours a day, seven days a week, of Chorus discovering or receiving notification of the Unplanned Outage	90%	

Fault Management for UBA Backhaul Service

Item No.	Level A/ Level B	Services to which Service Level relates	Service Attribute	Deliverable	Service Level	Tolerance Level	Exclusions
12.	Level B	UBA Backhaul Service	Fault report receipt acknowledgement	Chorus will acknowledge receipt of each fault report ³	Provide fault report receipt acknowledgement within half a Fault Restoration Hour of the fault being reported	90%	This Service Level does not apply where an invalid fault report has been submitted
13.	Level B	UBA Backhaul Service	Notification of expected restoration time	Chorus will provide notification of the expected restoration time ⁴	Provide notification of the expected restoration time: <ul style="list-style-type: none"> • within 4 Fault Restoration Hours; or • where the fault relates to the technical service specifications, within 8 Fault Restoration Hours (unless otherwise agreed between Chorus and the Access Seeker) of the fault being reported.	90%	

³ If a fault is logged outside Fault Restoration Hours, for the purposes of this Service Level, the report will be deemed to have been received at 7.00am the following day.

⁴ The expected restoration time will be provided in accordance with Chorus' fault prioritisation systems

Item No.	Level A/ Level B	Services to which Service Level relates	Service Attribute	Deliverable	Service Level	Tolerance Level	Exclusions
14.	Level A	UBA Backhaul Service	Meet notified expected restoration time	Chorus will restore the fault within the notified expected restoration time	Restore fault within notified expected restoration time	90%	

Appendix 2

Operational Support System SLAs for UBA Backhaul Service

Item No.	Level A/ Level B	Services to which Service Level relates	Service Attribute	Deliverable	Service Level	Tolerance Level	Exclusions
15.	Level B	UBA Backhaul Service	Availability of OO&T	Chorus will make OO&T available to the Access Seeker	OO&T is available to the Access Seeker 24 hours a day, seven days a week	99.8%	Availability to be measured 24x7 over a month, excluding any periods of Permitted Maintenance.
16.	Level B	UBA Backhaul Service	Availability of OFM	Chorus will make OFM available to the Access Seeker	OFM is available to the Access Seeker 24 hours a day, seven days a week	99.8%	Availability to be measured 24x7 over a month, excluding any periods of Permitted Maintenance.

Notes:

Where availability measured

In respect of Items 15 and 16, availability is measured from the point at which the public internet meets the OO&T or the OFM (as the case may be).

Permitted Maintenance

The OO&T and OFM systems may be taken out of service for routine maintenance, testing, configuration changes, software upgrades or updating facilities. Chorus will, where practicable, carry out such work between 10:00pm and 7:00am. In such cases, Chorus shall advise Access Seekers not less than 5 Working Days prior to the event.

Chorus may, at such other times as Chorus considers reasonably necessary, take the OO&T and OFM systems out of service, taking into account the need to minimise any disruption caused to the Access Seekers. Chorus will advise of such outages not less than 10 Working Days prior to the planned event.

Unplanned Outages

If the OO&T or OFM systems must be taken out of service to resolve a fault affecting the system, where reasonably practicable, Chorus shall give notice to the Access Seeker of any such unscheduled outages and the Access Seeker will be kept regularly updated regarding the resolution of the fault.

Appendix 3

Performance Penalties

Item No.	Level A / Level B	Services to which Service Level relates	Service Attribute	Deliverable	Tolerance Level	Performance Penalty
6	Level A	New Connection Relinquishment Speed Change Network Change Handover Link	Order is completed right first time	Chorus will complete Order without fault	90% (for each service)	<p>Where Chorus fails to meet the specified Tolerance Level, the Performance Penalty must be calculated in respect of each Order falling below the Tolerance Level, in accordance with the following formula:</p> <p>Performance Penalty = 7% of the provisioning Charge for the service to which the Service Level relates</p> <p>For clarity, in assessing which Orders (if any) fall below the Tolerance Level, each month's Orders must be assessed chronologically from time and date of failure to meet the Service Level</p>
7	Level A	New Connection Speed Change Network Change Handover Link	Meet notified expected RFS Date for the relevant UBA Backhaul service	Chorus will complete the Order by the notified expected RFS Date	90% (for each service)	<p>Where Chorus fails to meet the specified Tolerance Level, the Performance Penalty must be calculated in respect of each Order falling below the Tolerance Level, in accordance with the following formula:</p> <p>Performance Penalty = A x B</p> <p>Where:</p> <p>A = the applicable Penalty Rate</p> <p>B = the provisioning Charge for the service to which the Service Level relates</p> <p>For clarity, in assessing which Orders (if any) fall below the Tolerance Level, each month's Orders must be assessed chronologically from time and date of failure to meet the Service Level.</p>

Item No.	Level A / Level B	Services to which Service Level relates	Service Attribute	Deliverable	Tolerance Level	Performance Penalty
14	Level A	UBA Backhaul Service	Meet notified expected restoration time	Chorus will restore the fault within the notified expected restoration time	90%	<p>Where Chorus fails to meet the specified Tolerance Level, the Performance Penalty must be calculated in respect of each fault falling below the Tolerance Level, in accordance with the following formula:</p> <p>Performance Penalty = A x B</p> <p>Where:</p> <p>A = the applicable Penalty Rate</p> <p>B = the sum of the Charges for all Primary Links and Secondary Links (as defined in the UBA Backhaul Service Description) detrimentally affected by the fault.</p> <p>For clarity:</p> <p>(a) in assessing which faults (if any) fall below the Tolerance Level, each month's faults must be assessed chronologically from time and date of failure to meet the Service Level; and</p> <p>(b) a fault that detrimentally affects a Secondary Link also detrimentally affects associated Primary Links and must be taken into account as part of the penalty calculation.</p>

Calculation of Penalty Rate

Where any Order or fault has not been completed or restored (as the case may be) within the period required by the relevant Service Level (taking into account the Tolerance Level), the Penalty Rate for the initial Service Level Default will be 7%. For:

- (a) every 9 Business Hours (that is, the equivalent of a full Working Day) that the Service Level Default continues to not be resolved, if the Service Level Default relates to a UBA Backhaul service Order (that is, item 7); or
- (b) every 12 Fault Restoration Hours that the Service Level Default continues to not be resolved, if the Service Level Default relates to fault restoration (that is, item 14),

the Penalty Rate will increase by one percentage point.

If the Service Level Default relates to a Service Level that is not time based (that is, item 6 "Order is completed right first time"), the escalating Penalty Rate will not apply.

Example

The following is an example which illustrates how Performance Penalties for item 7 ("Meet expected RFS Date") will be calculated.

Chorus completed 10 New Connection Orders during the calendar month. For three of these Orders Chorus failed to complete the Order within the notified expected RFS Date. In this example, the Tolerance Level is 90% which means Chorus will not be penalised financially for one of these three defaults. Default number one exceeded the expected RFS Date by 45 Business Hours (that is, the equivalent of five Working Days). As this was the first default in the calendar month, the applicable Penalty Rate of 12% does not have any effect because default number one falls within the Tolerance Level. Default number two exceeded the expected RFS Date by 27 Business Hours (that is, the equivalent of three Working Days), so the applicable Penalty Rate is 10%. Default number three (the last default in the calendar month) exceeded the expected RFS Date by 9 Business Hours (that is, the equivalent of one Working Day), so the applicable Penalty Rate is 8%. The Performance Penalties will be calculated as follows:

Default number 2:

A = the applicable Penalty Rate = 10%; B = the provisioning Charge for the service to which the Service Level relates = \$8,059 (Two Ends as defined in the UBA Backhaul Price List)

Performance Penalty = $A \times B = 10\% \times \$8,059 = \$805.90$

Default number 3:

A = the applicable Penalty Rate = 8%; B = the provisioning Charge for the service to which the Service Level relates = \$8,059 (Two Ends as defined in the UBA Backhaul Price List)

Performance Penalty = $A \times B = 8\% \times \$8,059 = \$644.72$

Appendix 4

Standard Lead-Times for Orders

UBA Backhaul Service	Standard Lead-Time (calculated from the Working Day immediately following the Deemed Acceptance Time)
Backhaul New Connection Order	21 Working Days if fibre and capacity is available at the relevant FDS and ASNAPOI
Backhaul Relinquishment Order	15 Working Days
Speed Change Order (no Truck Roll required)	5 Working Days
Network Change Order	25 Working Days
Handover Link Order (Equipment available) Handover Connection (Equipment available) Speed Change Order (where Truck Roll required and equipment available)	21 Working Days
Handover Link Order (No equipment available) Handover Connection (No equipment available) Speed Change Order (where Truck Roll required but no equipment available)	Three to six months (dependant on equipment lead times)