

## **NSTAR Arlington Reliability Enhancement Project Status Report as of: June 27th, 2005**

The Four-Phase NSTAR Arlington Reliability Enhancement Project is well under way toward establishing a state-of-the-art electric distribution system in the Town of Arlington. This plan was presented to the Arlington Board of Selectmen on August 12<sup>th</sup>, 2002, and timely updates on our progress were provided on March 20<sup>th</sup>, 2003, September 29<sup>th</sup>, 2003, June 28<sup>th</sup>, 2004 and today, June 27<sup>th</sup>, 2005. Phase-One and Phase-Two have been completed and are performing well. Arlington residents and businesses have already benefited from the electric distribution infrastructure improvements that have been implemented since the summer of 2002. Electrical system reliability, as measured in both frequency and duration of electrical outages, has improved as expected in the completed areas.

Additional engineering analysis resulted in an expansion of the scope of work for the Project, which required the reconductoring and upgrading of an additional underground circuit (250-H6) from Everett to Arlington to improve capacity and reliability. This additional work was completed May 15, 2003, and had impacted the schedule of the Project. Added work is being engineered to replace 20,000 feet of underground conductors for circuit 211-H14 to serve southeast Arlington that will be implemented in Phase-Three. Timely installation of new taller 45-foot poles has been a real barrier to completion of the various Phases of this project, which has created a significant demand on the limited pole-setting resources of Verizon to keep up with the Project's conversion schedule. The added scope of work and pole-setting requirements have resulted in delays in aspects of the Project (Please reference the Revised Schedule below).

In addition to NSTAR's use of in-house electrical crews, NSTAR has contracted with outside contractors to expedite Project progress. NSTAR is committed to making Arlington's Electric Distribution System the model that all other Massachusetts communities will aspire to replicate. At completion of this Project, Arlington will be served by seven 13.8 kV circuits, with sectionalizing capability, constructed to the latest industry standards. Generally, each pole will carry only one circuit and the infrastructure, including poles, crossarms, guys, transformers, switches, primary and secondary conductor wiring, will be of newer construction, which will result in marked improvement in reliability.

### General Progress Report:

Verizon has been a very important partner in accomplishing the required preparation for the 13.8kV conversions in Arlington. NSTAR must rely upon Verizon to install all of the new taller 45-foot poles required in each successive phase of the Project before a contract for a phase's circuit conversion may be released for bid and construction. We effectively must install a new parallel 13.8kV circuit to the existing operating 4kV circuit, cut over to the new higher voltage system and then decommission the old 4kV circuit. Verizon was able to accomplish the Phase-Two pole installations in a timely manner but were significantly delayed in completing the installation of the required 320 taller poles for Phase-Three. Installation of these 320 taller poles was not completed until early June 2005. The Phase-Three 13.8kV conversion contract could not be released for bid until all the taller poles had been installed. A pre-bidders conference is scheduled for July 11<sup>th</sup>, 2005, the contract will be awarded on August 1<sup>st</sup>, 2005 and Phase-Three conversion is schedule for completion on November 15<sup>th</sup>, 2005, barring weather delays. Verizon will continue to be an important partner in achieving progress on the Project, particularly in setting the next Phase-Four required taller poles, currently estimated in excess of 500+ poles.

Arboriculturally correct tree pruning for the Project has been on schedule, except for the Phase-Three area where Verizon has recently finished installing the 320 taller poles. Tree pruning in the Phase-Three area was purposefully delayed to ensure accurate tree pruning relative to the new taller poles and avoid over-pruning, which might upset residents. Phase-Three tree pruning is underway now and will be completed by mid-July 2005. Tree pruning has been achieved with the on-going cooperation from both residents and Arlington Town officials. NSTAR's Vegetation Management group is currently reviewing Arlington outage data to identify areas, if any, that might benefit from additional tree pruning. Police details have been cooperative and valuable in assisting crews throughout the construction process.

Phase-One is complete. The four existing 13.8 kV circuits in Arlington, which are generally located in mid-Arlington, have all been upgraded to the current 13.8 kV construction standards.

Phase-Two is complete. A new 13.8 kV overhead & underground distribution circuit (211-H3), originating in Woburn and traversing Winchester, now feeds the Morningside section. New taller poles, guys, cross-arms and primary conductor wiring have been installed on the Backbone and Taps in the Morningside area, and upgrades to the side streets have been completed. All side taps off the Backbone have been fused to limit the impact of any potential future power outage. Significant additional transformer capacity has been added. Installation of lightning protecting ground rods to protect both the circuit and equipment have been installed. Installation of auto-sectionalizing units, which enable automated electric load transfers, are complete. This system enhancement will reduce long-term outages.

Phase-Three is underway. NSTAR developed a comprehensive pole-by-pole installation schedule to precisely locate and sequence all the necessary taller poles that Verizon had to set. These taller poles were required to be set prior to any Phase-Three circuit conversions and Verizon completed the installation of the 320 poles in early June 2005. Tree pruning in the Phase-Three area is underway and is scheduled for completion mid-July 2005. Installation of the 320 new poles had to be in place before the Phase Three 13.8 kV circuits could be installed.

Phase-Four is pending. NSTAR will extend a new circuit from Lexington into West Arlington and we will rely upon Verizon to set the required taller poles.

### **Revised Schedule**

#### Phase-One

- (New work added to Project). Reconductored and upgraded an additional underground circuit (250H6), which extends from Everett to Arlington's Mystic Substation. Completed May 15th, 2003.
- Upgraded all existing 13.8 kV infrastructure in Arlington to the current 13.8 kV construction standards. Two of the four 13.8 kV circuits (211-H14 & 59-1393H1) have been completed, and the remaining two circuits (211-H11 & 351-1385H1) underwent special circuit upgrades (added scope) to replace connectors, selected additional tree pruning and add additional animal protection and lightning arrestors. Completed.

#### Phase-Two

- Convert five 4kV circuits (211-07, 380-02, 59-02, 59-06, 380-05) to 13.8 kV distribution. Completed July 19<sup>th</sup>, 2004.

### Phase-Three

- (New work added to Project): Replacement of 20,000 feet of underground conductors for circuit 211-H14 to serve southeast Arlington will be complete by November 15<sup>th</sup>, 2005.
- Installing 13.8 kV distribution circuit 211-H9 in southeastern section of Arlington. This is projected to be completed November 15<sup>th</sup>, 2005, weather permitting.
- Convert five 4 kV circuits to 13.8 kV: 59-03, 59-05, 59-07, 59-08 & 380-03. This projected is to be completed by November 15<sup>th</sup>, 2005, weather permitting.

### Phase-Four

- Extend new circuit from Lexington to convert western section of Arlington, including 4 kV step-down areas of 351-1385H1 and 211H14. Design and engineering is in progress. Additional 4 kV circuits include 59-01, 351-04, 351-05 and 351-06 will also be converted. Provided the poles are set by May 1<sup>st</sup>, 2006 (not confirmed by Verizon, as yet) and weather permitting, the 13.8 kV circuit conversions will be completed by September 1<sup>st</sup>, 2006.

### **Town of Arlington/NSTAR working Items:**

The need for proper guying of the taller 45-foot poles continues to be an issue that NSTAR has identified as a potential barrier to completion of the Project. Wherever possible, NSTAR will mitigate the need for guys, or support posts and/or guy wires, however certain pole locations absolutely require guys for stability and safety. Generally, wherever a line of poles turns a corner or terminates a line, a guy post and/or guy wire system is necessary to offset or balance the tension of the wires or load on the pole. We respectfully request that residents and town officials work with us to properly locate guys.

We wish to express our appreciation to town residents and officials for their support and cooperation to date. We acknowledge and greatly appreciate the significant and essential role that Verizon has played in working with NSTAR to set a record-number of required taller poles in Arlington, without which this project could not proceed. We continue to work with Verizon to accomplish the necessary pole sets in Phase-Four (500+ poles) and greatly appreciate their on-going resource commitment to the Project.

Our significant progress toward installation of infrastructure improvements in Arlington have exacerbated the double-pole count in the Town and we respectfully request that the community bear with us as we push to complete the Reliability Enhancement Project. We do not want to divert critical resources to double poles until we have completed the reliability portion of the project. We will then address the double poles as the last action of the Project.

We wish to thank everyone for their patience and understanding while NSTAR completes these system improvements for the benefit of our Arlington customers.

## **ADDENDUM**

### Recent Outages

Town Manager Brian Sullivan, Chair of the Board of Selectman, Jack Hurd, Selectman Diane Mahon, former Selectman Charles Lyons, as well as staff at the Board of Selectmen, have each

contacted NSTAR to advise of Arlington residents' complaints concerning a rash of electrical outages/interruptions experienced between May 1<sup>st</sup> 2005 and June 16<sup>th</sup>, 2005. NSTAR Engineering has reviewed these outages and reports the following:

Phase Area	% Affected	Cause	Customer Count	Circuit
	37%	Wind (Nor'easter)	4,137 total	
2			3,901	211-H11
2			20	351-1385H1
3			157	59-08
3			59	380-03
3	29%	Failed underground joint	3,364	380-03
3	15%	Primary wires	1,674	380-03
	13%	Trees	1,498 total	
4			691	211-H14
3			291	5908
3			49	5908
3			173	5908
2			6	211-H11
2			84	211-H3
3			204	59-1393-H1
3	5%	underground cable fault	569	5907
3	1%	overloaded conditions: 10 incidents	142	5901
	0%	Other reasons:		
2		Hit by Auto	28	5903
4		Insulator failure	15	211-H14
4		Faulty connection	1	211-H14

Please reference the attached 'Arlington Outage Causes – May 1<sup>st</sup> to June 16<sup>th</sup>, 2005' Pie Chart; the 'Arlington Circuit Outage Distribution - May 1<sup>st</sup> to June 16<sup>th</sup>, 2005' Pie Chart; and the 'Arlington Circuits - Customers Affected – 5/1/05 to 6/16/05' Table for further details.

These figures indicate that the areas of the Arlington Reliability Enhancement Project that have been completed to date are performing very well (Phase-One & Phase-Two), while the Phased areas that remain to be converted to 13.8kV continue to suffer service interruptions (Phase-Three & Phase-Four.) All areas of Arlington are subject to electrical outages from Nor'easter storms or tree damage, without regard to the completion of the Phased circuit conversions, due to the vulnerable nature of the overhead distribution system that is subject to adverse weather conditions. NSTAR is committed to working toward mitigating outages in Arlington but residents must realize that some outage is unavoidable and NSTAR cannot guarantee uninterrupted power.

During this period, NSTAR experienced a number of factors that have exacerbated problems in Arlington:

1. An NSTAR labor strike by our Electrical Workers Union #369 that disrupted our normal course of maintenance and repairs and required reassignment of management personnel to cover these necessary responsibilities. The strike commenced on May 15<sup>th</sup> 2005 and was settled with all electrical workers back on the job by June 6<sup>th</sup>, 2005.

2. A freak Nor'easter storm on May 25 and 26<sup>th</sup>, 2005 that resulted in extremely high winds and significant tree damage in Arlington and elsewhere that resulted in extended outages. Arlington suffered significant tree damage and many wires were down that required tree crews to clear the streets and roadways prior to restoration efforts.
3. An extended heat wave of 90 degrees plus for three consecutive days over June 12<sup>th</sup>, 13<sup>th</sup> and 14<sup>th</sup>, 2005.

While we realize these intermittent power interruptions can be very disruptive and uncomfortable, NSTAR continues to work toward implementing the 4 kV circuit conversions to 13.8 kV in Phase-Three and Phase-Four of the Arlington Reliability Enhancement Project, which will improve the electric reliability in those areas of Arlington. We greatly appreciate the patience, understanding and cooperation residents and Town officials have extended to NSTAR during this disruptive period. NSTAR is committed to improving electric reliability in Arlington and to serving our customers well.

Respectfully submitted to the Arlington Board of Selectmen, June 27, 2005, by:

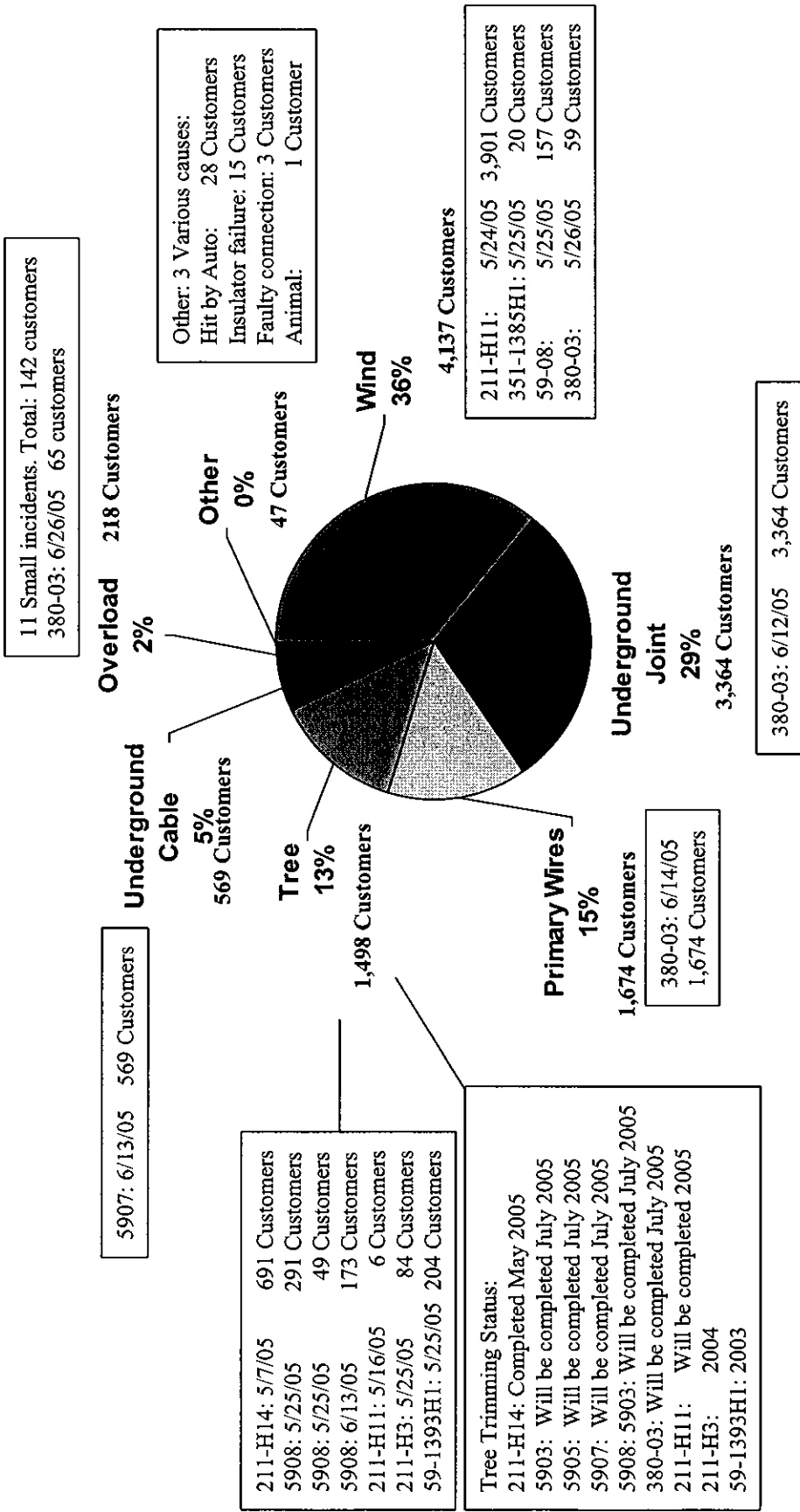
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File: Arl Dist. Enhance 6-27-05.doc

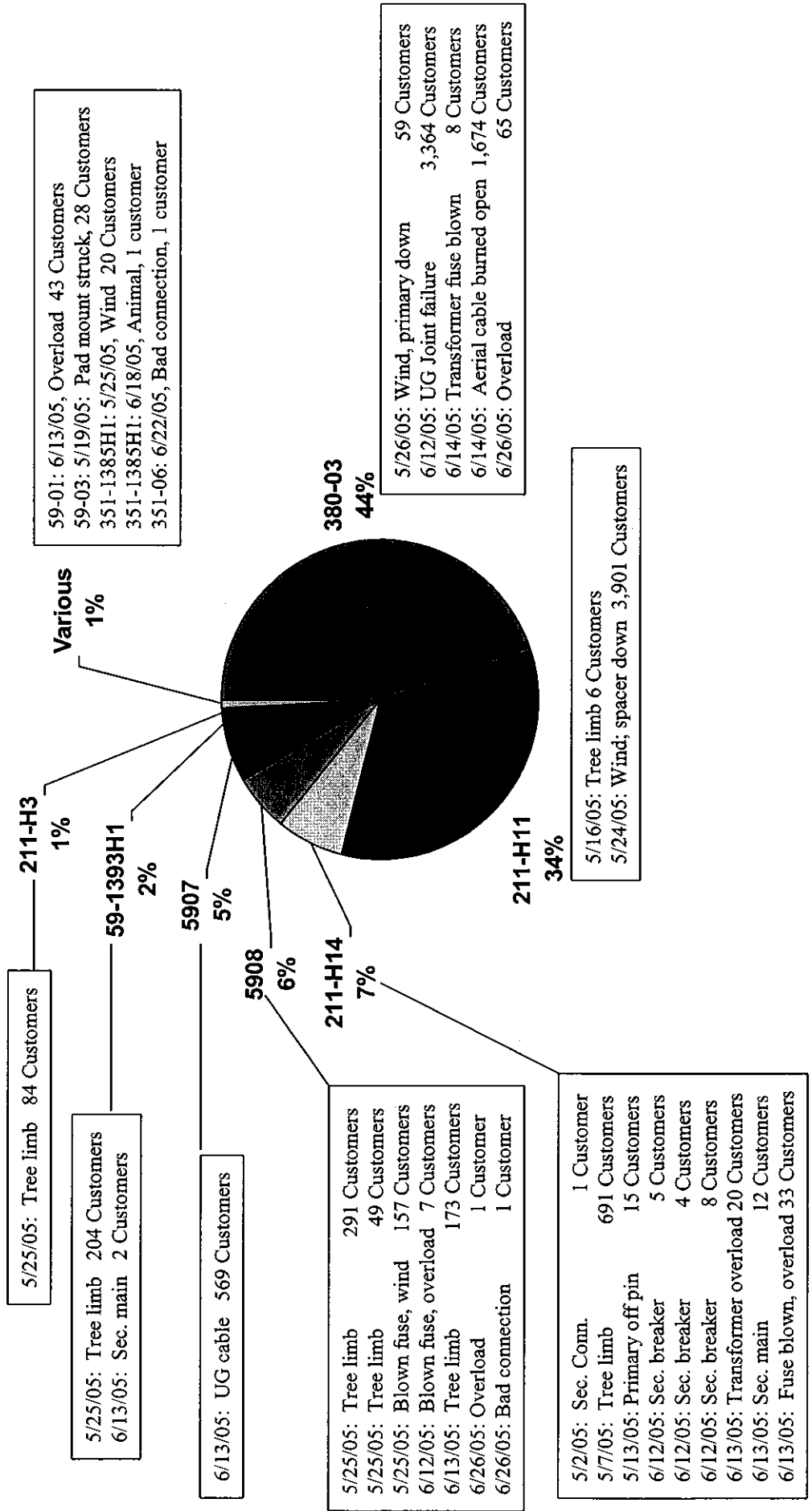


## Arlington Outage Causes - May 1, 2005 to June 27, 2005





## Arlington Circuits Outage Distribution, May 1, 2005 to June 27, 2005





## Arlington Circuits – Customers Affected – 5/1/05 to 6/27/05

Circuit	Date	Cause	Customers
211-H11	5/24/05	Wires down, wind	3901
380-03	6/12/05	UG joint failure	3364
380-03	6/14/05	Aerial primary burned open	1674
211-H14	5/7/05	Wires down, tree	691
5907	6/13/05	UG cable failure	569
5908	5/25/05	Fuse blown, tree	291
59-1393H1	5/25/05	Fuse blown, tree	204
5908	6/13/05	Fuse blown, tree	173
5908	5/25/05	Fuses blown, wind	157
211-H3	5/25/05	Fuse blown, tree	84
380-03	6/26/05	Overloaded sec main failure	65
380-03	5/26/05	Wires down, wind	59
5908	5/25/05	Fuse blown, tree	49
5901	6/13/05	Overloaded fuse blown	43
211-H14	6/13/05	Overloaded fuse blown	33
5903	5/18/05	Caused by others - pad struck	28
211-H14	6/13/05	Overloaded transformer failure	20
351-1385H1	5/25/05	Fuse blown, wind	20
211-H14	5/13/05	Phase wire off pin	15
211-H14	6/13/05	Overloaded sec main failure	12
211-H14	6/12/05	Overloaded sec breaker open	8
380-03	6/14/05	Blown transformer fuse	8
5908	6/12/05	Overloaded fuse blown	7
211-H11	5/16/05	Fuse blown, tree	6
211-H14	6/12/05	Overloaded sec breaker open	5
211-H14	6/12/05	Overloaded sec breaker open	4
59-1393H1	6/13/05	Overloaded sec main failure	2
211-H14	5/2/05	Secondary connection failed	1
351-1385H1	6/18/05	Animal	1
351-06	6/22/05	Secondary connection failed	1
5908	6/26/05	Secondary connection failed	1
5908	6/26/05	Overloaded secondary wires	1