ATLANTIC DIVISION
NORFOLK, VIRGINIA

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Contract No. N62470-99-D-3251
High Antenna Tower System Inspection

Tower Inspection Report
600' Guyed Tower No. 2637
Grindavik Transmitter Site, Iceland
Inspection Date: 31 July and 2 Aug 2001

CONTENTS

LIST OF PHOTOGRAPHS

√ A photo reference is checked if there is a related work item in the Recommended Maintenance section of the report.

EXECUTIVE SUMMARY

The 600' Guyed Tower No. 2637 located at the Grindavik Transmitter Site in Grindavik, Iceland was inspected on 31 July and 2 Aug, 2001 by Gary Lehman and Philip Nickels. The temperature varied between 48° F to 55° F with overcast skies and light winds. The tower is triangular in configuration with a 7' face width and nominal height of 600'. The tower is guyed in three directions at the first and second levels and in 12 directions at the top. Tower members consisted of solid round bar columns and angle bracing. All members were hot-dipped galvanized after fabrication. The tower's weekly scheduled down day was every Tuesday. The inspection outbrief was conducted with Lt. Chris Haden (011-354-425-6118) on 3 August, 2001.

STRUCTURAL MEMBERS — Two diagonals were deflected on Face A at the 270' level (Photo No. 24) and at the 260' level (Photo No. 25). These damaged members were previously noted in the FY91, FY93, and FY95 Inspection Reports. Both members should be replaced within one year.

OBSTRUCTION MARKING AND LIGHTING — Inspectors estimated 20% of the paint was missing on the lacing members and 85% missing on the tower legs. The legs were rusty throughout the tower (Photos No. 2-4, 14, 16-19, 21, 27, 29, 33). Because of the deteriorated paint coverage, the tower is no longer conspicuously marked for aircraft during daylight hours. In addition, the severity of the climate in Iceland accelerates the deterioration of unprotected surfaces. We recommend all corroded areas be mechanically cleaned and primed and that the tower be completely painted within one year.

The lighting system was not equipped with a photocell control and the lights burned continuously. Continuous burning shortens the life of the bulbs and increases energy costs, especially during the long daylight hours of the summer. A photocell control should be installed within one year.

First level steady burning lights were mounted on the inside of the tower leg (Photo No. 19). To provide a more unobstructed view of the lights by approaching aircraft, the lights should be remounted on the outside of the tower leg within one year. Two of four and one of four beacon cathode tubes were not functioning at the 300' (Photo No. 26) and top level beacons (Photo No. 34), respectively. Because of these deficiencies, the mid-level beacon output was cut by 50% and the top beacon by 25%. None of the four light levels are operating properly. These towers are in a flight path and the inspectors noted many airplanes flew relatively close to the towers during the inspection. Defects with the beacons and steady burning lights have been identified in the 1995

Inspection Report, replacements are on site and should be installed immediately. This is a safety hazard than can be corrected with relative ease and insignificant expenditure and it should not be delayed any longer. The inner coating in the top of the light dome had deteriorated at the top beacon (Photo No. 35). The beacons should be lowered and the light dome replaced with the local forces' spares immediately. One bulb was missing from a fixture at the third light level (Photo No. 32). Local forces should install a new bulb immediately.

Inspectors noted all the junction boxes in use at the time of the inspection were corroded (Photo No. 18 and 31), and one box was missing a cover screw near the 380' level (Photo No. 28). The third light level steady burning lights were not in operation and faulty wiring was suspected. New wiring should be installed to this light level immediately. If necessary, temporary wiring can be installed until the planned repair of the entire lighting system can be accomplished. Local forces had installed new junction boxes (Photos No. 16 and 23).

The first level steady burning lights flickered on and off with the voltage resting at 10% below the fixture rated voltage of 240V and then dropping to 17% (from 240V) as the beacon flashed. The beacon voltage varied between 17% and 19% below the fixture rated voltage of 240V. The steady burning (model: ZA760 240V) and beacon (model: ZA766 240V) lights were manufactured by Alstom Power Conversion in the United Kingdom (44-0-1788-563563). Mark Healey with Alstom stated the ZA760 240V steady lights were designed to operate between the range of 198V and 256V. Since the steady light voltage was dropping just short of 198V, this could be causing the lights to momentarily flicker. The voltage should be boosted by replacing the isolation transformer within one year. The table below shows the voltage measured at each light level.

Obstruction Light Data

Light Level	Type	Elev.	Fixture Count	Measured Voltage	Bulb Wattage
1	Steady	155'	3 (1 tube each)	197 V	29 W (cathode tube)
2	Beacon	300'	1 (4 tubes each)	198 V	600 W (cathode tube)
3	Steady	450'	3 (1 tube each)	0 V	29 W (cathode tube)
4	Beacon	600'	1 (4 tubes each)	197 V	600 W (cathode tube)

The obstruction lights are powered through an isolation transformer manufactured by Austin Insulators Model No. A-2490-A. Inspectors noted a small oil leak at the base of the transformer (Photo No. 8). Normally, this condition would call for the oil level to be checked periodically,

however, the oil gauge was broken (Photo No. 7). The transformer was not providing adequate voltage for the 240V system. The output voltage varied between 194 and 216 V. Given the transformer is 40-50 years old and replacement parts are no longer manufactured, the isolation transformer should be replaced within one year.

Obstruction light control box conduit was connected with zip ties (Photo No. 11) near the base. The conduit should be removed and replaced with a longer run that allows for a drip loop and connected with proper weatherproof fittings within one year.

GUY SUBSYSTEM — Hairpins were fully extended at ten anchors (Photos No. 38 and 39). Anchors affected were first level guy anchor C, second level guy anchor C, second level guy anchor A, and radial anchors 2, 3, 4, 5, 6, 10 and 12. The next time the guy wires are tensioned and the tower plumbed, attempts should be made to center the sockets on the hairpins to facilitate future tension adjustments. If it is not possible to center the sockets while maintaining proper tensions and verticality, it may be necessary to install additional link plates at the anchors to extend the hairpins toward the tower and accommodate additional adjustments (No cost estimate is included for these items).

Inspectors noted corrosion on guy wires where ground clamps were once connected (Photos No. 40 and 41). Within one year the corrosion should be mechanically cleaned and coated with a cold-galvanizing compound and conductive grease should be applied beneath the clamps to prevent further corrosion.

Inspectors examined the first insulator from the tower on all radial spans through a Questar telescope and noted minor rusty cotter pins and minor corrosion on a socket (Photos No. 44 and 45). No action is required.

VERITICALITY — The tower's verticality was satisfactory with the largest deviation being 3.75" at the top.

ANTENNA SYSTEM —Rusty bands supporting riser wires at each leg splice (Photos No. 15 and 21) should be replaced within one year.

MISCELLANEOUS — Column B ground jumper near the 13' level was broken (Photo No. 10). A new ground jumper should be installed within one year. Inspectors noted the base insulator was dirty. Local forces should increase the frequency of cleaning of this insulator so dirt and salt

residue do not build up.

OSHA STANDARDS — As stated previously in the July 1995 Inspection Report, none of the platforms were equipped with ladderway opening protection (Photo No. 13 and 36) and only the top platform was enclosed by railing. The installation of ladderway opening protection[1] and standard railing[2] at all platforms would be necessary to comply with OSHA standards. OSHA standards require a minimum 30" ladder climbing side clearance[3] and 7" back side clearance[4]. The ladder up the tower did not conform to these requirements. Possible solutions to ladder clearance problems include relocating the ladder to the outside of the tower or installing brackets to stand-off the ladder further from supporting members and attain additional back side clearance. Moving the ladder to the outside of the tower may not be practical because of interference from guy components. The installation of stand-off brackets may solve the backside ladder clearance deficiency but result in a climbing side deficiency. The ladder deficiencies were minor, created a very minor a safety hazard, and would be costly to correct. An analysis may determine that the costs of correcting the deficiencies out-weigh the benefits derived.

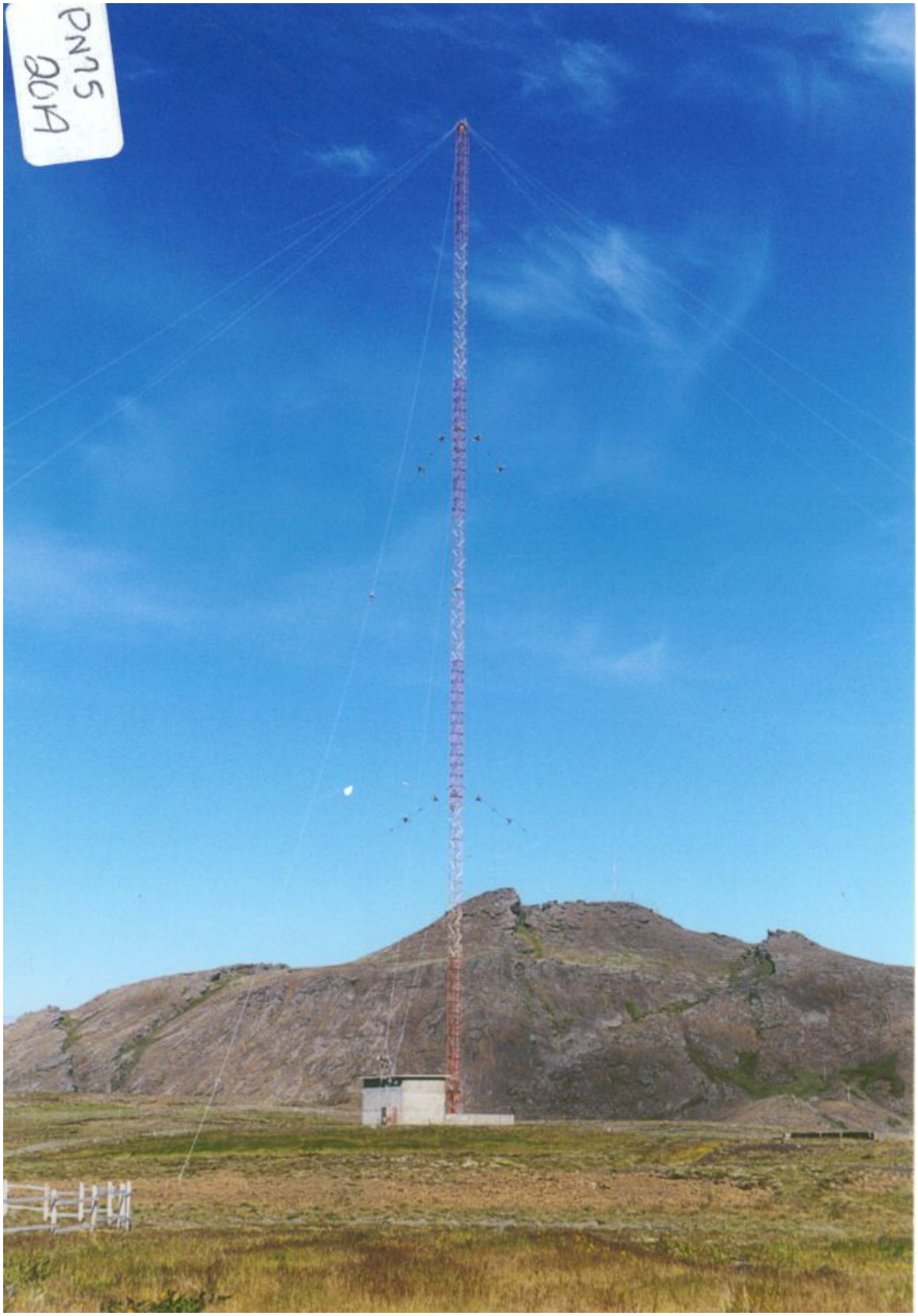


Photo No. 1

Photo No. 2

Photo No. 3

Photos No. 2-4 show the poor condition of the paint in the first, second and third white color bands, respectively. Inspectors estimated 20% of the paint was missing on the lacing members and 85% missing on the tower legs. The legs were rusty throughout the tower. Because of the deteriorated paint coverage, the tower is no longer conspicuously marked for aircraft during daylight hours. The tower should be cleaned and painted within one year.

Photo No. 4

Photo No. 5

Photos No. 2-4 show the poor condition of the paint in the first, second and third white color bands, respectively. Inspectors estimated 20% of the paint was missing on the lacing members and 85% missing on the tower legs. The legs were rusty throughout the tower. Because of the deteriorated paint coverage, the tower is no longer conspicuously marked for aircraft during daylight hours. The tower should be cleaned and painted within one year. Photo No. 5 is an overall view of the tower base area.

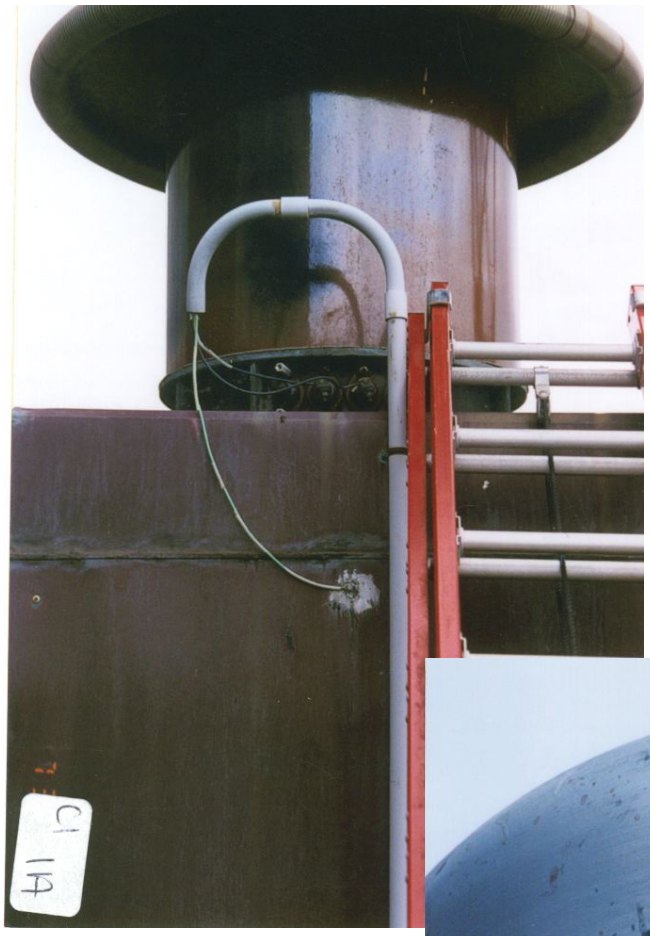


Photo No. 6

Photo No. 7

Photo No. 6 shows the incoming power supply to the isolation transformer. Inspectors measured the terminals as 118V each, totaling 236V. A broken oil gauge on the isolation transformer prevented the inspectors from checking the oil level in the transformer (Photo No. 7). The transformer should be replaced within one year.

Photo No. 8

Photo No. 9

Photo No. 8 reveals a small oil leak at the base of the isolation transformer. Normally, the inspectors would check the oil level of the transformer, however the oil gauge was broken (Photo No. 7). The transformer was not providing adequate voltage for the 240V system. The output voltage varied between 194 and 216 V. Given the transformer is 40-50 years old and replacement parts are no longer manufactured, the isolation transformer should be replaced within one year. Photo No. 9 shows the feed thru bushing in satisfactory condition.

Photo No. 10

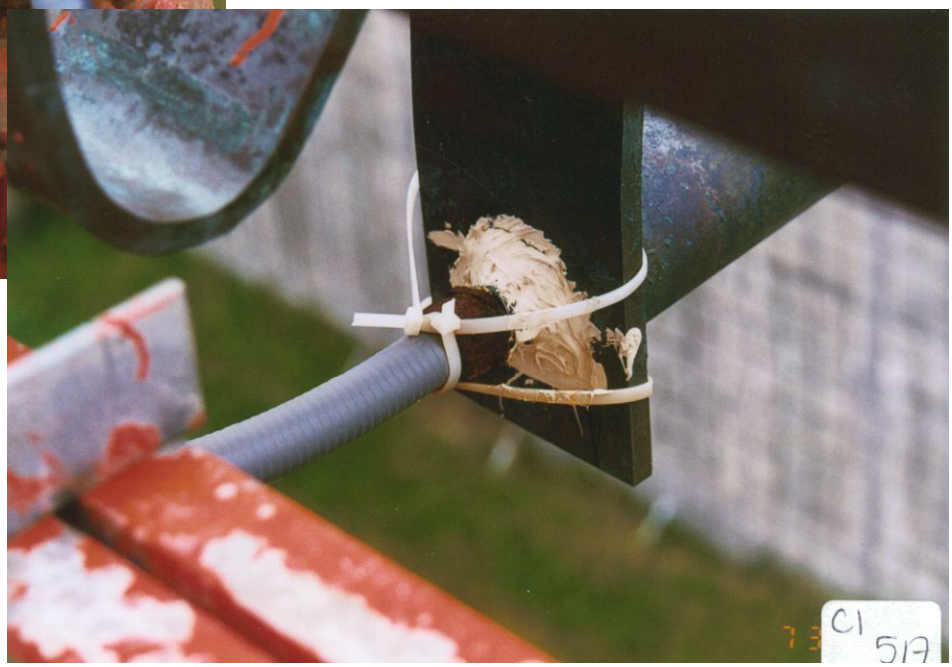


Photo No. 11

Column B ground jumper near the 13' level was broken (Photo No. 10). A new ground jumper should be installed within one year. Photo No. 11 shows a corroded conduit connection that was connected with zip ties. The conduit should be removed and replaced with a longer run that allows for a drip loop and connected with proper weatherproof fittings within one year.

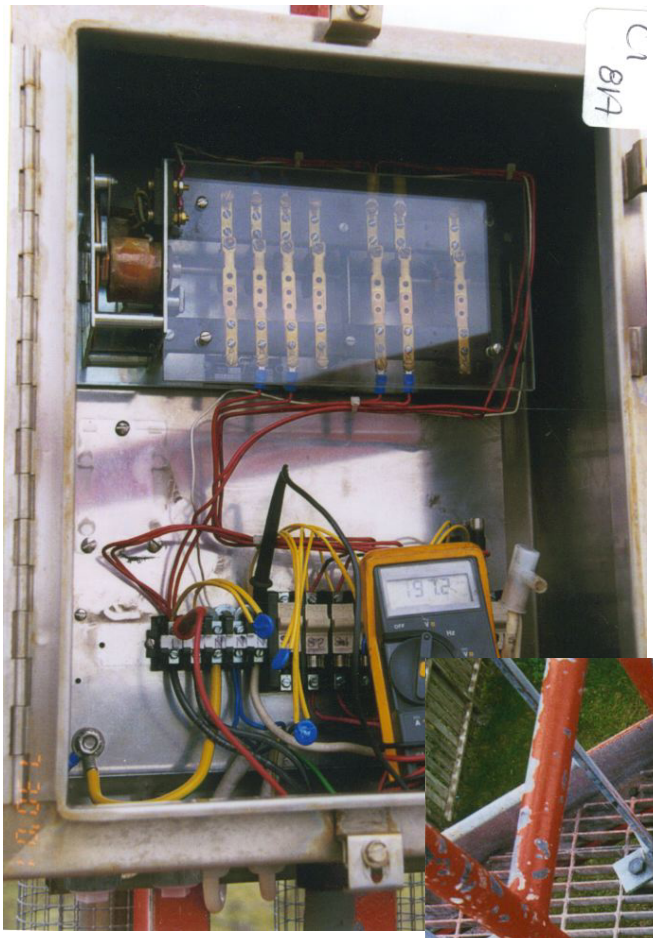


Photo No. 12

Photo No. 13

The incoming voltage at the light control box varied between 194 and 216 V. The lighting control box was in good condition at the 13' level (Photo No. 12). The platform at the 13' level (top of the tapered section) was not equipped with ladderway opening protection (Photo No. 13). Installation of ladderway opening protection would bring the platform into compliance with OSHA standards.

Photo No. 14

Photo No. 15

Photo No. 14 and 15 reveals typical corrosion at a gusset plate and band supporting riser wires, respectively, on Column A near the 40' level. The tower should be mechanically cleaned and painted within one year. Rusty riser wire restraining bands should be replaced within one year.

Photo No. 16

Photo No. 17

Local forces have installed stainless steel junction boxes on the tower (Photo No. 16). Photo No. 17 shows the ladder and safety rail free of corrosion and in good condition. Photos No. 16 and 17 were taken at the 90' and 110' levels, respectively, and reveal rust has replaced approximately 85% of the white paint along the tower legs. Because of the deteriorated paint coverage, the tower is no longer conspicuously marked for aircraft during daylight hours. The tower should be cleaned and painted within one year.

Photo No. 18

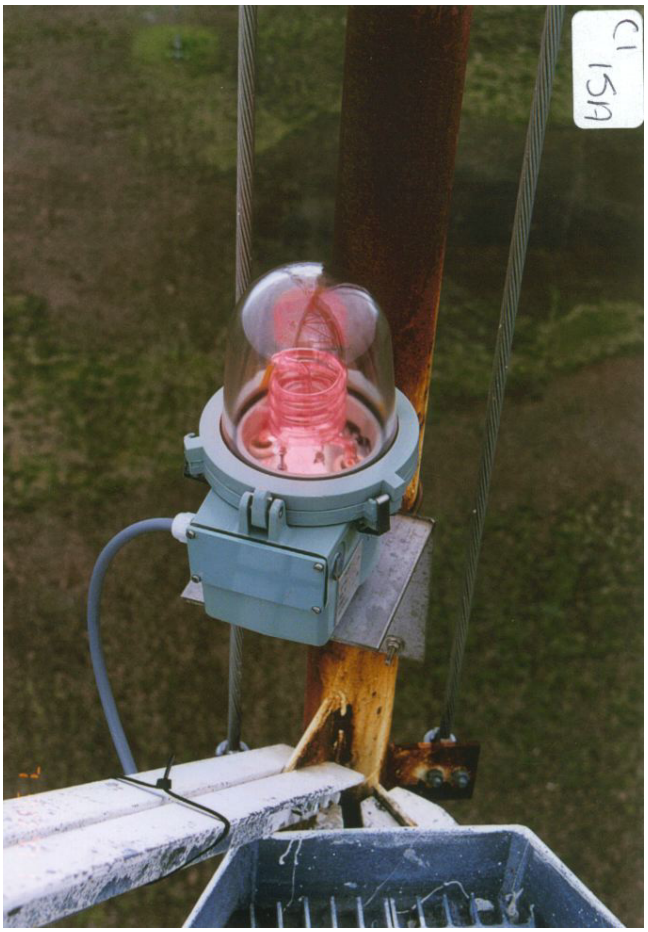


Photo No. 19

Photo No.18 shows corrosion inside the junction box for the first steady burning light level. First level steady burning lights were mounted on the inside of the tower leg (Photo No. 19). To provide a more unobstructed view of the lights by approaching aircraft, the lights should be remounted on the outside of the tower leg within one year. Photos No. 18 and 19 show closer views of rust, typical along the tower legs. The tower should be cleaned and painted within one year.

Photo No. 20

Photo No. 21

Photo No. 20 shows a typical first level guy insulator in good condition. Photo No. 21 shows typical corroded riser wire support band and rust along tower leg near the 220' level. All the support bands should be replaced and the tower cleaned and painted within one year.

Photo No. 22

Photo No. 23

Obstruction lighting conduit along Column B was not continuous near the 240' level (Photo No. 22). All lighting system wiring and conduit should be replaced within one year. Local forces had installed stainless steel boxes on Column A, shown here at the 240' level. At the time of the inspection, these boxes were not in use (Photo No. 23).

Photo No. 24

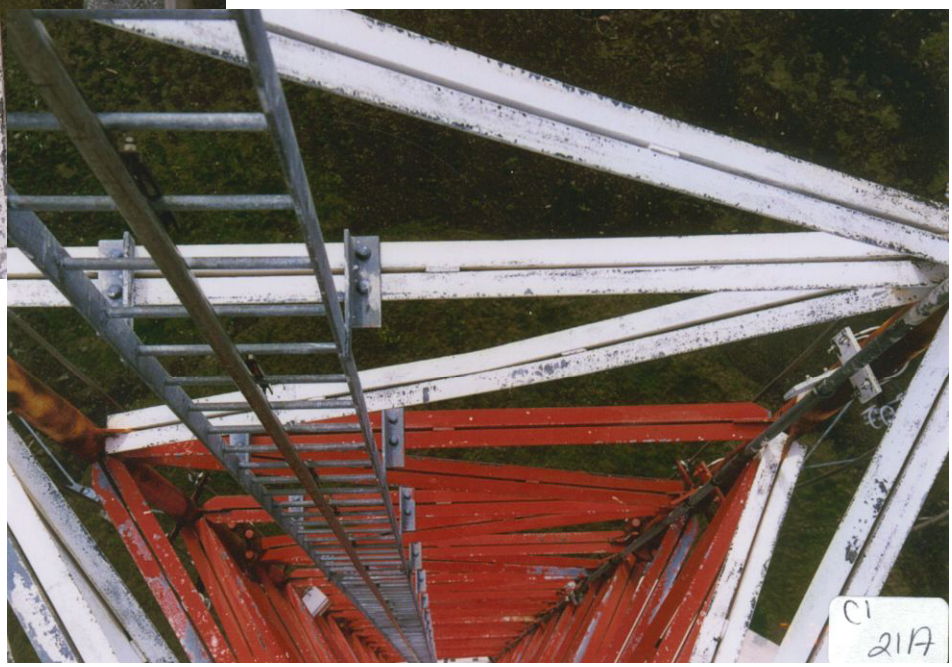


Photo No. 25

Photos No. 24 and 25 show deflected diagonals on Face A at the 270' and 260' levels, respectively. Both members should be replaced within one year.

Photo No. 26

Photo No. 27

Two of four beacon cathode tubes were not functioning at the 300' level (Photo No. 26). The beacon should be lowered and the light dome replaced with the local forces' spares immediately. Photo No. 27 shows rust along the tower leg at the 300' level. Because of the deteriorated paint coverage, the tower is no longer conspicuously marked for aircraft during daylight hours. The tower should be mechanically cleaned and painted within one year.

Photo No. 28

Photo No. 29

Junction box near the 380' level was missing a cover screw (Photo No. 28). Photo No. 29 is a view down the center of the tower from the 360' level showing rust along the tower legs with 20% obstruction paint missing from the lacing members. The tower should be mechanically cleaned and painted within one year conforming to FAA color banding guidelines.

Photo No. 30

Photo No. 31

Photo No. 30 shows a typical guy connection near the 400' level in good condition. The junction box at the third light level was corroded and the lights at this level were not in operation (Photo No. 31). Wiring to this light level should be replaced immediately.

Photo No. 32

Photo No. 33

A steady burning light at the third light level was missing a bulb (Photo No. 32). A new bulb should be installed immediately. Photo No. 33 is a view looking down from the top of the tower showing rust along a tower leg and paint coverage loss on the lacing members. The tower should be mechanically cleaned and painted within one year.

Photo No. 34

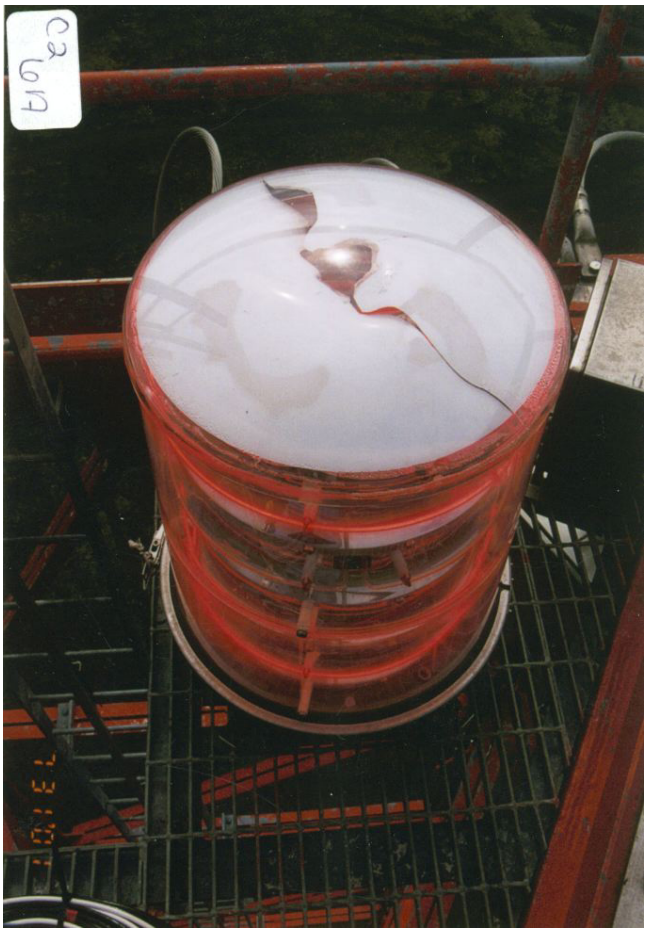


Photo No. 35

One of four beacon cathode tubes was not functioning at the top beacon (Photo No. 34), and the inner coating at the top of the light dome had deteriorated (Photo No. 35). The beacon should be lowered and the light dome replaced with the local forces' spares immediately.

Photo No. 36

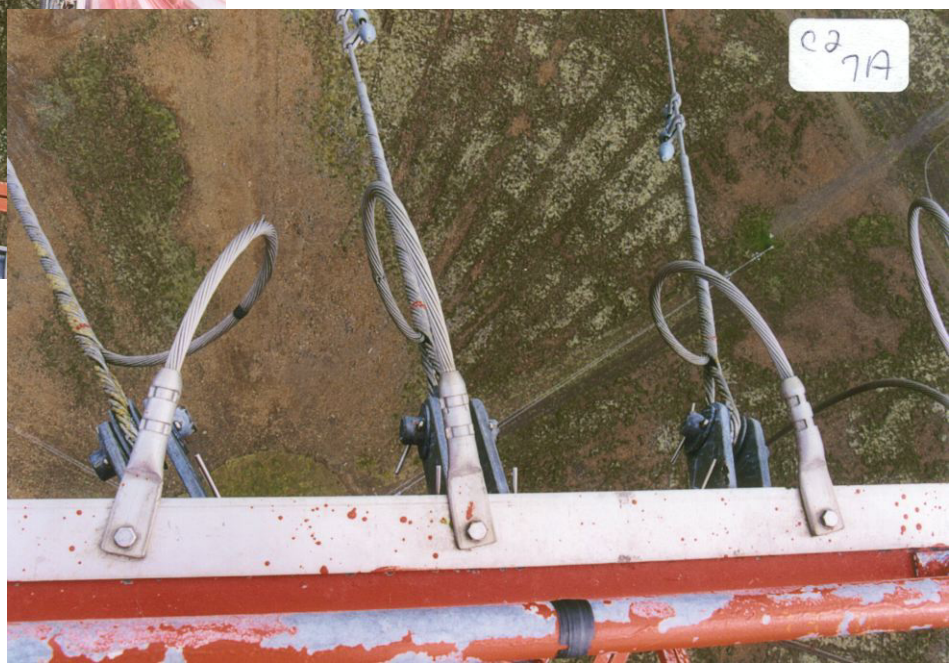


Photo No. 37

Top platform was not equipped with ladderway opening protection (Photo No. 36). Installation of ladderway opening protection would bring the platform into compliance. Photo No. 37 shows top radial connections in good condition at the top of the tower.

Photo No. 38

Photo No. 39

Photos No. 38 and 39 show fully extended hairpins at a guy anchor and radial anchor, respectively. This condition was typical at first level guy anchor C, second level guy anchor C, second level guy anchor A, radial anchors 2, 3, 4, 5, 6, 10 and 12. The next time the guy wires are tensioned and the tower plumbed, attempts should be made to center the sockets on the hairpins to facilitate future tension adjustments. If it is not possible to center the sockets while maintaining proper tensions and verticality, it may be necessary to install additional link plates at the anchors to extend the hairpins toward the tower and accommodate additional adjustments.

Photo No. 40

Photo No. 41

Photos No. 40 and 41 show corrosion on guy wires where grounding clamps were once connected. Within one year the corrosion should be mechanically cleaned and coated with a cold-galvanizing compound and conductive grease should be applied beneath the clamps to prevent further corrosion.

Photo No. 42

Photo No. 43

Photo No. 42 shows a typical good insulator near Radial 4 anchor. Photo No. 43 is a view of a typical good corona ring on Radial 11.

Photo No. 44

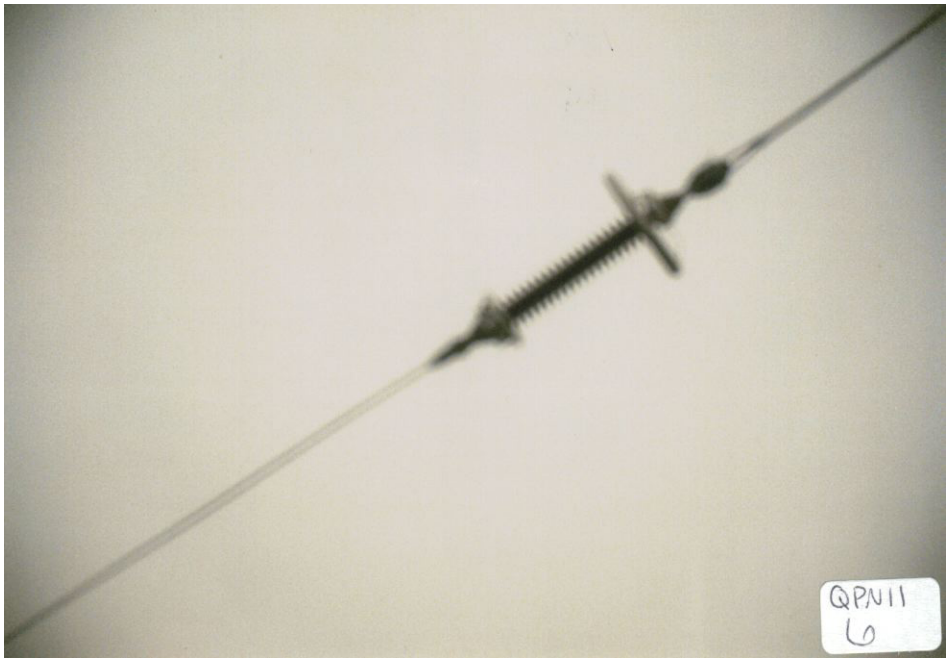


Photo No. 45

Inspectors noted rusty cotter pins on the first insulators from the tower on the radial wires (Photo No. 44), however no action is necessary. Inspectors noted minor corrosion on a socket, however no action is necessary (Photo No. 45).

RECOMMENDED MAINTENANCE

The two deflected diagonals at the 260' and 270' levels should be replaced in order to maintain the structural integrity of the tower. It is necessary to perform the recommendations outlined below in the suggested time frame to avoid more serious and costly repairs in the future.

OSHA STANDARDS: This tower does not fully comply with OSHA standards. The items required to upgrade the tower for compliance are outlined below. This requirement has no effect on the tower structure or its function. It is suggested that this upgrade is accomplished within two years for the purpose of cost estimating only, and it is not meant to imply that this work should be deferred.

Estimated maintenance costs for the following recommended maintenance is based on an estimated ironworker rate. Rates are computed including 20% overhead and 12% profit. Labor rates for work to be accomplished within one year have been escalated 5%; 10% for two years; 15% for three years. Equipment costs are included in these rates unless specified.

IMMEDIATELY:

1) Lower mid-level and top level beacons and replace with local forces' spares (Photos No. 26 and 34). Beacon is an Alstom ZA766 with a total weight of 93 lbs. Install a new bulb at the third light level (Photo No. 32) and install new wiring to this light level.

WITHIN ONE YEAR:

1) Replace isolation transformer. (existing transformer was manufactured by Austin Insulator - Model No. A-2490-A). Remove conduit that runs to the obstruction light control box at the base of the tower and replace with a longer run (approx. 20') that allows for a drip loop. Connect conduit with proper weatherproof fittings (Photo No. 11). Replace tower lighting wiring and conduit throughout the tower. Remount steady burning lights (6 total) to the outside of the tower legs to provide a more unobstructed view of the lights by approaching aircraft (Photo No. 19). Steady burning lights are Alstom ZA760. Install photocell control for lighting system.

2) Mechanically clean rusty areas and paint the entire tower (Photos No. 2-4, 14, 16-19, 21, 27, 29, 33).

3) Install new ground jumper on Column B (Photo No. 10).

4) Replace 78 rusty bands securing riser wires to leg splice flanges (dia. approx. 11") with stainless steel bands (Photos No. 15 and 21).

5) Replace deflected diagonals on Face A at the 270' and 260' levels (Photos No. 24 and 25).

WITHIN TWO YEARS:
OSHA STANDARDS:

1) Install ladderway opening protection at the 13' level and top level platform (Photos No. 13 and 36).

HISTORICAL INFORMATION

Date	Description	Cost
1983	Initial erection	
1986	Tensioned guy wires	
1987	Inspection by Tower Inspection, Inc.	
1988	All radial insulator corona rings were replaced.	$25,000
1989	Inspection by Tower Inspection, Inc,	
1991	Inspection by Tower Inspection, Inc,	
1993	Inspection by Tower Inspection, Inc,	
1995	Inspection by Tower Inspection, Inc,	
2001	Inspection by Tower Inspection, Inc,	

REFERENCES

[1] U.S. Department of Labor, Occupational Safety and Health Administration, *Code of Federal Regulations, Title 29 – Labor: 1998* (Washington, DC: GPO, 1998) 99.

[2] U.S. Department of Labor, Occupational Safety and Health Administration, *Code of Federal Regulations, Title 29 – Labor: 1998* (Washington, DC: GPO, 1998) 101.

[3] U.S. Department of Labor, Occupational Safety and Health Administration, *Code of Federal Regulations, Title 29 – Labor: 1998* (Washington, DC: GPO, 1998) 108.

[4] U.S. Department of Labor, Occupational Safety and Health Administration, *Code of Federal Regulations, Title 29 – Labor: 1998* (Washington, DC: GPO, 1998) 108.

COST ESTIMATING FORM WORKSHEET | NAVAL FACILITIES ENGINEERING COMMAND | Sheet 1 of 3

To Be Completed Immediately

CONTRACT NUMBER: N62470-99-D-3251

ACTIVITY:	LOCATION:	TOWER HEIGHT & DESIGNATION:
NCTS Iceland/NRTF Grindavik	**Grindavik, Iceland**	**600' Guyed Tower No. 2637**

PROJECT:

FY2001 High Antenna Tower Systems Inspections

ITEM (OR FEATURE) DESCRIPTION	QUANTITIES		MATERIAL COST		LABOR COST	
	NO. OF UNITS	UNIT	UNIT COST	COST	UNIT COST	COST
1) Replace top & mid beacons, install new bulb & wiring at 3rd light level	108	MH			$122.06	$13,182
Beacons	2	EA		GFE		
Bulb	1	EA		GFE		
Wiring	400	FT	$0.20	$80		
Project Management and Clerical Services						$3,829
Mobilization						$19,706
Equipment						$4,000

APPROVED BY:	TITLE:	DATE:		
W. Michael Byers	**Vice President**	**11-Oct-01**	**LABOR COST**	$17,011
			MATERIAL COST	$80
			TOTAL COST (EST.)	**$40,797**

TOWER Inspection INC.

COST ESTIMATING FORM WORKSHEET	NAVAL FACILITIES ENGINEERING COMMAND	Sheet 2 of 3
To Be Completed Within One Year		CONTRACT NUMBER: N62470-99-D-3251
ACTIVITY: **NCTS Iceland/NRTF Grindavik**	LOCATION: **Grindavik, Iceland**	TOWER HEIGHT & DESIGNATION: **600' Guyed Tower No. 2637**
PROJECT: **FY2001 High Antenna Tower Systems Inspections**		

ITEM (OR FEATURE) DESCRIPTION	QUANTITIES		MATERIAL COST		LABOR COST	
	NO. OF UNITS	UNIT	UNIT COST	COST	UNIT COST	COST
1) Replace oil filled transformer; Replace conduit & fitting; replace conduit and wiring throughout the tower; relocate lights outside of tower; install photocell	216	MH			$128.17	$27,685
Transformer- Austin Model A-9600-B	1	EA	$112,000.00	$112,000		
Conduit	700	FT	$1.83	$1,281		
Electrical wiring (No. 6)	2800	FT	$0.20	$560		
Photo cell	1	EA	$50.00	$50		
Junction boxes	6	LOT	$250.00	$1,500		
New foundation	1	LS	$5,000.00	$5,000		
Miscellaneous materials & parts	1	LOT	$2,000.00	$2,000		
2) Clean rusty areas and completely paint tower (materials included)	600	FT			$143.57	$86,142
3) Replace column ground jumper	8	MH			$128.17	$1,025
Jumper and exothermic weld materials	1	LS	$200.00	$200		
4) Replace riser bands	36	MH			$128.17	$4,614
Stainless steel riser restrainer bands	75	EA	$30.00	$2,250		
5) Replace diagonals	36	MH			$128.17	$4,614
Materials fabrication	2	EA	$200.00	$400		
Engineering, design and detailing	1	LS	$1,000.00	$1,000		
Project Management and Clerical Services						$3,829
Mobilization						$19,706
Equipment						$4,000

APPROVED BY:	TITLE:	DATE:		
W. Michael Byers	**Vice President**	**11-Oct-01**	**LABOR COST**	$124,080
			MATERIAL COST	$126,241
			TOTAL COST (EST.)	**$277,856**

COST ESTIMATING FORM WORKSHEET	NAVAL FACILITIES ENGINEERING COMMAND	Sheet 3 of 3
To Be Completed Within Two Years		CONTRACT NUMBER: N62470-99-D-3251

ACTIVITY:	LOCATION:	TOWER HEIGHT & DESIGNATION:
NCTS Iceland/NRTF Grindavik	**Grindavik, Iceland**	**600' Guyed Tower No. 2637**

PROJECT:

FY2001 High Antenna Tower Systems Inspections

ITEM (OR FEATURE) DESCRIPTION	QUANTITIES		MATERIAL COST		LABOR COST	
	NO. OF UNITS	UNIT	UNIT COST	COST	UNIT COST	COST
OSHA						
1) Install ladderway opening protection at the lower and top platform	144	MH			$134.27	$19,335
Gates	2	EA	$390.00	$780		
Materials fabrication	200	LBS	$2.50	$500		
Engineering, design and detailing	1	LS	$1,000.00	$1,000		
Project Management and Clerical Services						$3,829
Mobilization						$19,706
Equipment						$4,000

APPROVED BY:	TITLE:	DATE:		
W. Michael Byers	**Vice President**	**11-Oct-01**	**LABOR COST**	$23,164
			MATERIAL COST	$2,280
			TOTAL COST (EST.)	**$49,150**

TOWER Inspection INC.

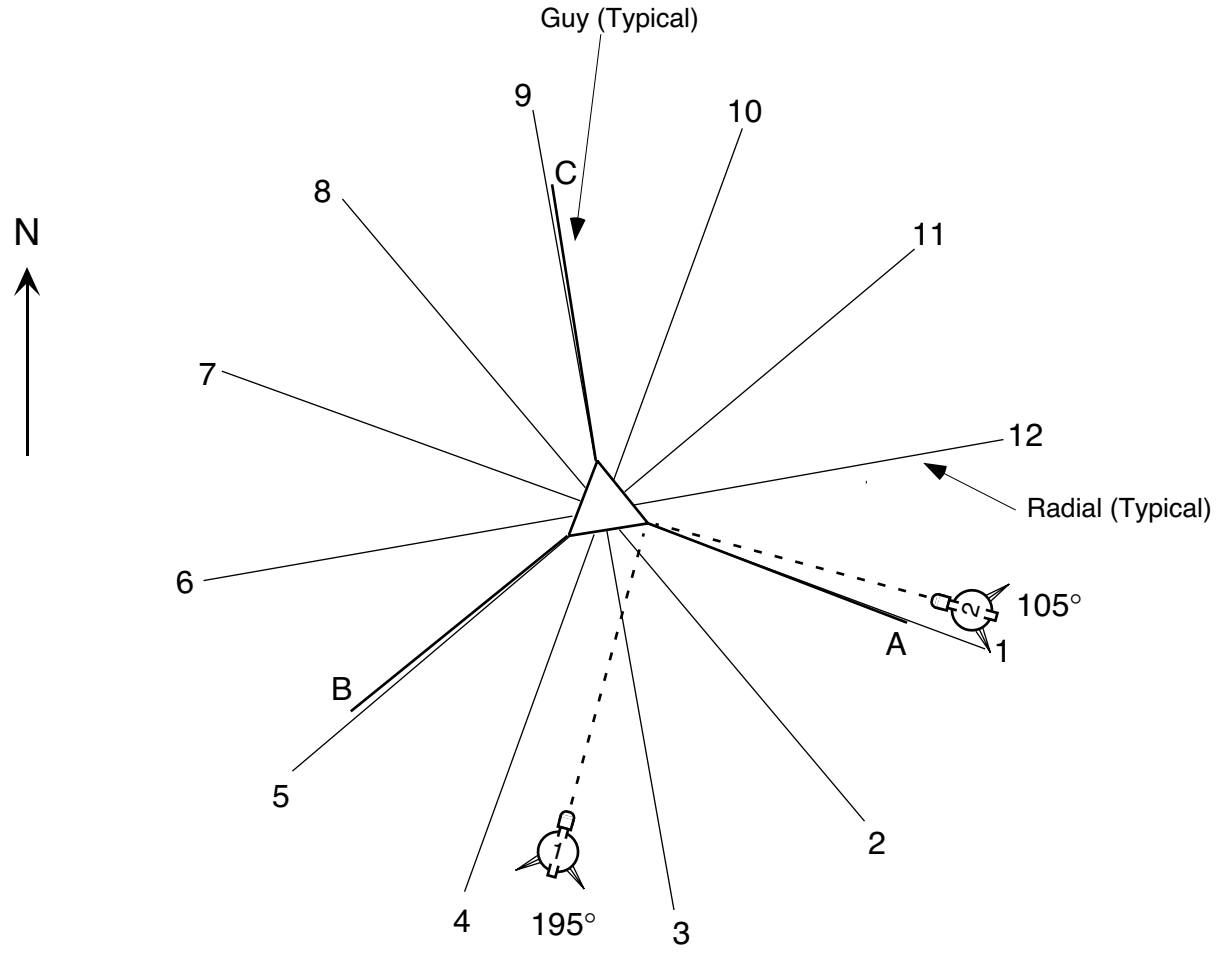
Date: 7/31/01

Time: 3:30 pm

Temp: 48° F

Wind: W @ 5 MPH

Weather: Cloudy



NOTE: Angles are measured from magnetic north

Position / Elevation	1	2	Position / Elevation	1	2	Position / Elevation	1	2
	Deviation from Vertical			Deviation from Vertical			Deviation from Vertical	
Mid Span	0	1 L	2nd Guy	2.5 L	1.75 L			
1st Guy	1.5 L	1 L	Mid Span	2.75 L	2.5 L			
Mid Span	2.5 L	1.5 L	Top	3.75 L	3 L			

TOWER Inspection INC.

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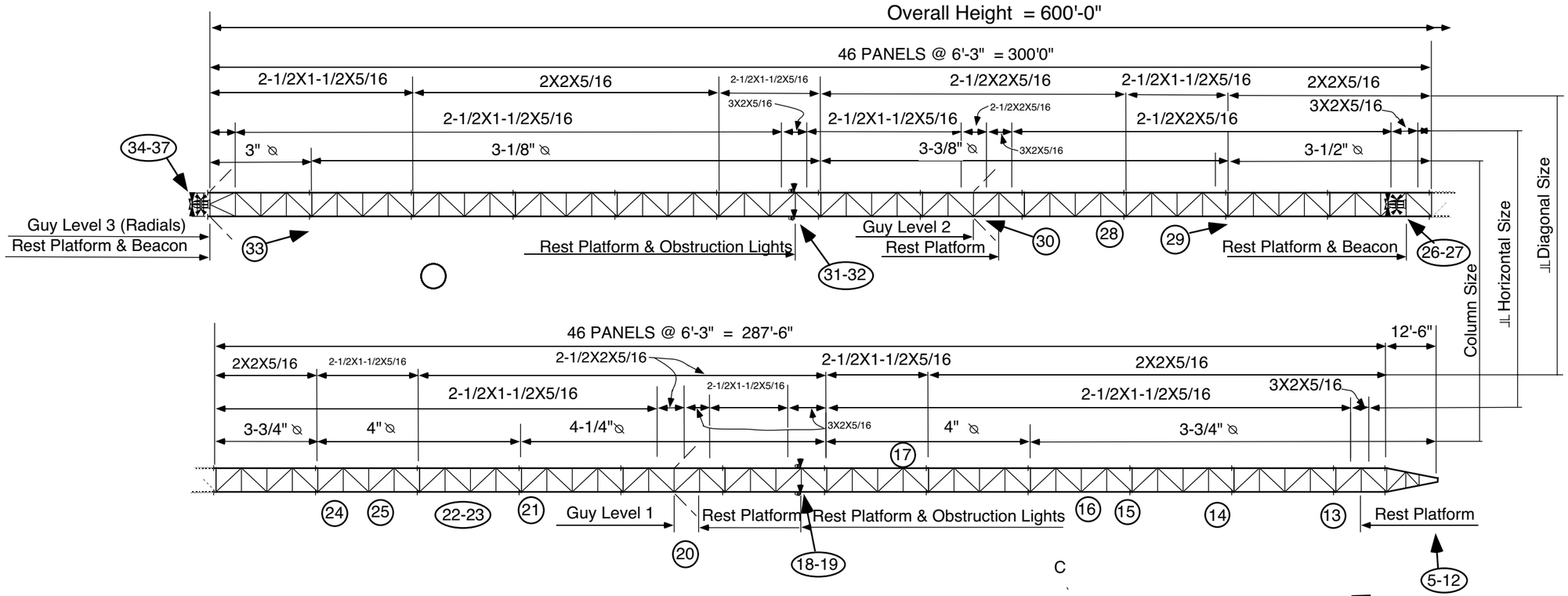
DEPARTMENT OF THE NAVY
ATLANTIC DIVISION
NORFOLK, VIRGINIA

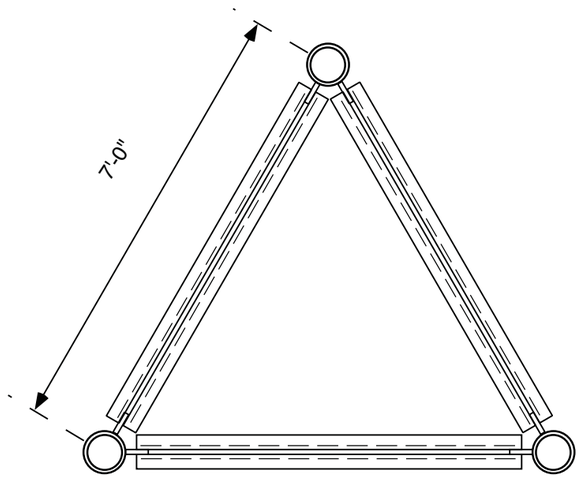
VERTICALITY TABULATION
600' Guyed Tower No. 2637
Grindavik Transmitter Site, Iceland

Drawn By: PEN

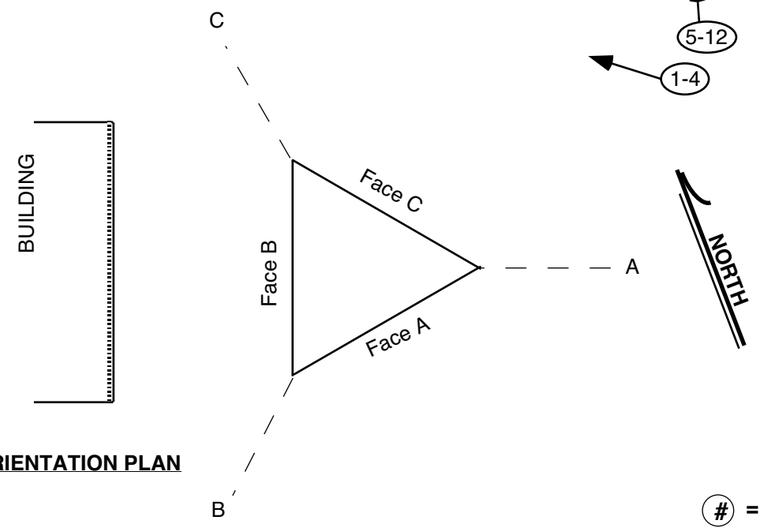
Date: 8/18/01

Contract No.: N62470-99-D-3251





TYPICAL SECTION



ORIENTATION PLAN

(#) = PHOTO REFERENCE NO.

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NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK, VIRGINIA 23511-2699

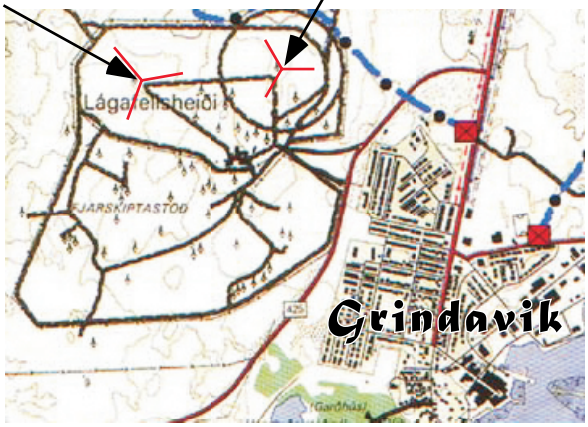
DESCRIPTIVE DRAWING AND PHOTO REFERENCE
600' Guyed Tower No. 2637
Grindavik Transmitter Site, Iceland

Drawn By: PEN Date: 8/18/01

Contract No.: N62470-99-D-3251 Sheet No. 36

1000' LF Tower

600' Tower No. 2637



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LOCATION MAP / PLOT PLAN
Grindavik Transmitter Site, Iceland

Drawn By: PEN Date: 7/1/2001

Contract No.: N62470-99-D-3251 Page No. 37

Inspection Service Checklist and Field Report

Location: Grindavik, Iceland Tower No.: 2637

Height-Type: 600' Guyed Date: 3 Aug 2001

Notes: This checklist is comprised of two sections as follows: 1) this cover page which is a basic checklist completed by the inspector(s) immediately following the inspection and 2) a summary of field notes explaining deficiencies and suggesting maintenance. Each checklist is marked with an NA (Not Applicable), an X (detailed information in section two), or an S (satisfactory condition – no additional information). This field report is prepared to insure a complete inspection and to provide the local facility with immediate information following the inspection. The final report, to be submitted at a later date, will include this field report without modification. Specific suggested maintenance items in this field report may be modified, expanded, or deleted when reviewed by our engineering staff prior to inclusion in the Recommended Maintenance section of the final report.

Tower No.: 2637 Date: 3 Aug 2001 Inspector: GGL / PEN

Wind Direction: W Velocity (mph): 5-8

Temp (F°): 50 Weather Conditions: Overcast

TOWER SUBSYSTEM		GUY SUBSYSTEM		PAINT	
S	Legs, Splices	S	Insulators, Conn's	S	No. of Bands
S	Struts	S	Guys, Connections	X	Coverage
X	Diagonals	S	Guy Anchors	X	Condition
S	Bracing	X	Grounding		
S	Gusset Plates	S	Hairpins	OTHER SYSTEMS	
S	Connections	S	Pull-Off Plates	X	Obst. Lights
X	Ladder Cages	S	Vibration Dampers	X	Controls
S	Safety Climb			X	Conduit, J-boxes
X	Platform, Grating	FIXED TOP HAT & ANT. SYSTEM		NA	Receptacles
NA	Guides, Rollers	S	Wire, Conductors	X	Voltage
NA	Sheaves	S	Jumpers, Clamps	S	Internal Connects
NA	Outriggers	S	Insulators	NA	Auxiliary
X	Base Insulators	X	Feeds, Feed Cages	NA	Insulators
S	Jumpers	NA	Hinge, Counterweight	NA	Elevator
S	Foundations	NA	Microwave Antennas		
NA	Trunions	NA	Antenna Mounts		
		NA	Waveguide, Coax		

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Tower Subsystem:

1. (Tower members) safety hazards, deflections, deformation, looseness, missing items, twist, and other deficiencies:

Two deflected diagonals near the 260' and 270' elevations should be strengthened

2. (Tower members) corrosion, lamination, cracking, and other damage:

Satisfactory

3. (Connections, splices, welds, bolts, nuts and rivets) deficiencies, defects, and looseness:

Satisfactory

4. (Base insulators, jumper cables and associated fittings) cracks, flaws and other damage:

Bas insulators should be cleaned on a regular basis.

5. (Ladders and safety rails, cages, platform railing, and ladderway opening protection) compliance with OSHA standards, corrosion or other damage:

Ladder doesn't have required clearance. No ladderway opening protection at platforms.

6. (Guyed towers) plumb, verticality, straightness and dimensional deviations:

Satisfactory

7. (Foundation) cracks, flaws, and other damage:

Satisfactory

Fixed Top Hat and Antenna Subsystem:

1. (Wire, conductors, jumpers, clamps, insulators and other associated elements, components, connections and hardware) corrosion, deterioration, abrasion, abnormalities, damage, deficiencies, and other defects:

Satisfactory

2. (Outside portion of the feed through bushing, all feeds, insulators, feed cage, hinge, hinge counterweight assembly, fan, truss and other associated appurtenances and hardware) corrosion, deterioration, abrasion, abnormalities, damage, deficiencies, and other defects:

Riser clamps were rusty and should be replaced throughout the tower when the tower is repainted.

3. (Microwave antennas, auxiliary antennas or equipment, antenna mounts, waveguide, coax and associated hardware, components and connections) corrosion, deterioration, looseness, improper installation, damage, deficiencies, and other defects:

Not Applicable

Guy Subsystem

1. (Guy wire) any deficiency observed during visual inspection with binoculars and/or Questar telescope with special emphasis given to all insulator connections where installed:

Satisfactory

2. (Guy wire connections on the tower and at the anchorage) corrosion, deterioration, looseness, improper installation, damage, deficiencies, and other defects:

Satisfactory

3. (Tower/guy grounding, guy anchors, hairpins, vibration dampeners and pull-off plates) corrosion, deterioration, looseness, improper installation, damage, deficiencies, and other defects:

Minor corosion of wire caused by ground clamps. Clean and paint corroded area. Use conductive grease.

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Paint:

1. Proper number of bands, coverage and condition:

Paint coverage is very poor with rust throughout the tower. Complete repainting is necessary.

Other Systems

1. (Obstruction lighting, controls, hoods, shields, internal connections, and receptacle fittings) proper operation, proper voltage, condition, and conformance to FAA and other pertinent regulations:

Voltage range was 193-216V, far below 240 designed of fixtures. First sidelights went off when beacons came on. First beacon had 50% of light rings out (2 of 4) and top beacon had 25% out. There was no photocell control so lights burn continuously. Second sidelight level out with no voltage. Suspect wiring short.

2. (Conduit, clamps, fittings, junction boxes and other fittings) corrosion, deterioration, damage or breaks:

Conduit fittings are corroded - one break in conduit. Site glass broken on isolation transformer.

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Information Requested and Received from the OIC

Required Information	Requested	Received
Any Specific Items and Peculiarities Requiring Special Attention	☒	☒
Date Antenna Tower System was Erected	☒	☒
Initial Cost of Antenna Tower System	☒	☐
Cost and Date of Previous Repairs	☒	☒
Nature of Repairs (Give Details)	☒	☒
Date, Type of Paint, and Cost of Last Painting and Repair Work	☒	☐
Preferred Pin Location (for transit set up on guyed towers)	☒	☐
As-built or Recommended Guy Tensions for all Guyed Towers	☒	☐
Latest Measured Guy Tensions (Guys Larger than 1" in Diameter)	☒	☐
Station Plot Plan	☒	☒
Use of Antenna Tower System	☒	☒
Previous Years Inspected by Subject Contract	☒	☒

OSHA Standards

☐ The tower referenced on page I has been inspected and was found to be in full compliance with OSHA Regulations and Standards.

☒ The tower referenced on page I has been inspected and was found to be deficient in regard to OSHA Regulations and Standards. Actions to bring the tower into compliance are listed below:

Add ladderway opening protection

Grindavik, Iceland
Tower No: 2637

Certification of Inspection

Tower Inspection, Inc. certifies that all towers and appurtenances covered by this checkoff list were inspected on 31-JUL 2 AUG by a qualified antenna tower inspector who physically climbed the tower, and the physical conditions of each inspected tower (and antenna system if applicable) are summarized in the foregoing checkoff list.

SIGNATURES

Date: 3 AUG 2001

Inspector

OIC

Philip Nickels

Inspector

C. HADEN

Cognizant Activity Tower Officer or Authorized Rep

LT

Position/Title

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