

Excellence Award

NORTHROP GRUMMAN

2022



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St. Augustine Site

Site Features

- 8,000 ft. of shared runway with North Florida Regional Airport
- 151 acres, 38 buildings and 1.1 million square feet of office, manufacturing, lab, and warehouse space
- Production Capabilities
- · Agile, low-cost aircraft development, production and flight test
- · Aircraft depot-level maintenance, MRO
- Fabrication and assembly of aircraft structures, replacement spares and subassemblies
- Environmental friendly removal and application of paint and coatings
- State-of-the-art systems and processes for managing all phases from design and development to production and support





St. Augustine Environmental, Safety, and Health Team



NORTHROP GRUMMAN

Left to Right: Adrian Brown P.E., Tami Hays R.N., Julie Edwards Manager, Gina Williams Safety Coordinator, Quinn Soudrette R.N., Javier Garcia ESHM Engineer, Gavin Murray Sr. Principal ESHM Engineer, Dr. James Hall Audiologist (not shown)



SAFE-IN-SOUND

Audiograms

Ear-Fit Validation Testing



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- Baseline for new hires
- Annual Testing for Hearing Conservation Program Participants
- Education on hearing loss prevention and personal attributes that may accelerate hearing loss.



Beyond the Basics

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Comprehensive Hearing Test Report

Hearing Cons	servation Prog	ram: OSH	łA		Recent To	est: 10/14/	2021		Time:	14:15					
STS:	Age Correction Separate Bas	on: Yes elines: Yes		STS Left: STS Right:	It: No No STS Indicated It: No No STS Indicated										
Recordable: (10 dB)	Age Correctio Separate Bas	n: Yes alines: Yes	Recon Records	dable Left: able Right:	No No Recordable Indicated										
Referrals:	Questions: N	e information av	ailable		No No	ne									
Impairment:	Formula: A	AO 1979 FORM	ULA		Left:	0.0%	Right:	0.0%	Total:	0.0%					
Classification	5,1,2k Av	g 5,1,2,3k Avg	2,3,4k Avg	4,6,8k Avg	Low (.5,1	.2,3K Hz)	Mid (2,	3,4k Hz)	High	(4,6,8K Hz)					
Left Ear: Right Ear:	5.0 6.7	3.8 6.3	0.0 15.0	5.0 18.3	No No	rmal rmal	No Mostly	rmal Normal	Normal Mostly Normal						
Location:	Northrop Gru	umman - St. Aug	justine, FL												
Department:	(No Departm	ent Has Been 5	elected)		Job: (No Job Has Been Selected)										
Work Shift:															
Birth Date:	08/01/1984	Age: 37	Gender: Ma	le	Status: Active Hired: /										
				Tested By: Unknown											
Audiometer:	Earscan 3 E	arscan 3 SN: 0	1030300048	1B	Calibrated: 1/29/2021										
		Left Ea	r			Right	Ear								



					Le	n		Baselines				Figh	at 1			2,3,4k (Avg) Change AgeCorrect Uncorrected									
	Time	<u>.5k</u>	<u>1k</u>	<u>2k</u>	<u>3k</u>	<u>4k</u>	<u>6k</u>	8k STSLog Med STSLog	.5k	<u>1k</u>	<u>2k</u>	<u>3k</u>	<u>4k</u>	<u>6k</u>	₿k	STS Log It	Lt	Et	13	Bt /	Age 1				
10/14/2021	1415	10	5	0	0	0	15	0	10	5	5	5	35	20	0		-1.7	3.3	0.0	5.0	37				
09/10/2020	0947	10	5	0	0	0	10	5	10	5	5	5	35	15	0		-1.3	3.7	0.0	5.0	38				
10/22/2019	1556	5	0	0	0	0	5	0	5	0	0	5	30	10	0		-0.7	1.0	0.0	1.7	35				
11/06/2017	1142	5	0	0	0	0	15	0 Yes Yes Yes Yes Yes	5	0	0	0	30	15	0		0.0	0.0	0.0	0.0	33				



Consumer Ear Disease Risk Assessment

Consumer Ear Disease Risk Assessment(CEDRA)

Page | 1/3

This questionnaire is designed to help you decide if you need to see a doctor before obtaining a hearing device. If you have any medical questions or concerns about your hearing, you should see a doctor no matter what your score is on this questionnaire

Questions about your Ears and Hearing

Circle "Yes" or "No"

 When talking on a telephone, do you understand what people say better in one ear than the other? 	Yes	No
2. Did the hearing loss in either of your ears develop suddenly?	Yes	No
3. Have you ever had a sudden permanent change in your hearing?	Yes	No
4. Do you have hearing loss in only one ear?	Yes	No
5. Do you hear better in one ear than the other?	Yes	No
6. Does your hearing change from day to day?	Yes	No
7. As an adult, have you ever had more than one infection in the same ear during one year?	Yes	No
8. Have you ever noticed pus, blood or other active fluid discharge from your ear?	Yes	No
9. Have you ever been told by a physician that you have Meniere's disease?	Yes	No
 erall how would you rate your health?		

10. Overall, how would you ra

- Very good □Good □Poor □ Verv poor 11. How often do vou have dizziness? □Never Occasionally □Frequently □Always
- 12. How would you rate your balance?
 - □ Verv good
 - □Good
 - □Poor
 - - □ Very poor

One Department's Hearing Protection Selection Based on E-A-Rfit Testing

- Hearing Protection is not one size fits all. We provide employees choices
- Departments may use hearing protection based on the tasks, testing, and noise exposure
- All hearing PPE is provided by the employer whether you are a visitor, contractor, or full time employee

Percentage	of Hearing	Protection	Devices	Being	Utilized	
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NORTHROP

Brand Name of Hearing Protection Device	Number of Employees Using Device	% of Use
Skull Screw	7	50%
FX	3	21%
Classic	3	21%
Earmuffs	1	7%





Main Manufacturing Hangar UTL Values by HEG



Research, Deploy, and Try Again



Hi-Tigue riveting was modeled before moving into our new building in 2015

Noise sources from other departments did not impact the entire building, so no need for a building-wide alert system



Modeling did not reflect actual once occupied

Homogenous Exposure Groups

Data Description	n: Dept 1872 Outer Wing Panel Box Beam	
OFI	DESCRIPTIVE STATISTICS	
85	Number of samples (n)	34
	Maximum (max)	91
Sample Data	Minimum (min)	63
(max n = 50)	Range	28
No less-than (<)	Percent above OEL (%>OEL)	11.765
r greater-than (>)	Mean	74,400
76.4	Median	73.850
78.9	Standard deviation (s)	7.831
85.1	Mean of logtransformed data (LN)	4.304
79.6	Std. deviation of logtransformed data (LN)	0.105
91.0	Geometric mean (GM)	74.005
86.4	Geometric standard deviation (GSD)	1.110
89.7		
79.4	TEST FOR DISTRIBUTION FIT	
63.6	W-test of logtransformed data (LN)	0.952
68.2	Lognormal (a = 0.05)?	Yes
66.6		
74.6	W-test of data	0.949
65.4	Normal (a = 0.05)?	Yes
69.8		
73.9	LOGNORMAL PARAMETRIC STATISTICS	
66.7	Estimated Arithmetic Mean - MVUE	74.399
67.5	LCL _{1,95%} - Land's "Exact"	72.212
72.8	UCL _{1,95%} - Land's "Exact"	76.736
82.3	95th Percentile	87.900
79.8	UTL95% 95%	92.928
72.2	Percent above OEL (%>OEL)	9.270
81.6	LCL _{1,95%} %>OEL	4.394
78.8	UCL _{1,95%} %>OEL	17.649
70.1		
78.3	NORMAL PARAMETRIC STATISTICS	
80.6	Mean	74.400
69.3	LCL _{1,95%} - t statistics	72.127
80.1	UCL _{1,95%} - t statistics	76.673
63.9	95th Percentile - Z	87.283
63.0	UTL95%,95%	91.45
73.8	Percent above OEL (%>OEL)	8 794



Noise exposure varies during the build cycle

Industrial Hygiene Statistics

SAFE IN SOUND

71.6 63.6 65.0

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> 99% 98% 95% 90% 84% 75%

50%

25% 16%

10%

100

Front Line Manager Support

GRUMMAN

July 15, 2021

Northrop Grumman 2980 Fairview Park Drive Falls Church, Virginia 22042-4511

Dear Submission Team

I would like to provide my endorsement of the effort Northrop Grumman has put in place to support the protection of our enployees' hearing through safely best practices. I believe Northrop Grumman has one of the leading Hearing Conservation programs in the industry. The company performs the normal hearing lest and provides 3M ear fit-dual validation tests to personalize earbig selection for employees. This lest allows the employee to choose what suits them best to protect their hearing while performing specific tasks. The 3M test allows you to test the actual ear protection and see how well it performs to your specific personal living. The education and consistent health, medical and safety support Northrop Grumman provides figling employees and me is what makes this company stand out as a leader.

Thanks

Chaz

Chaz Thorne Manager, General Manufacturing O: 904-810-4573 5000 US 1 North St. Augustine, FL 32095

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Northrop Grumman Corporation 5000 US 1 North St. Augustine, FL 32095

July 1, 2021

To Safe-in-Sound Committee:

As an alreadt production manager with Northrop Grumman, I have many responsibilities, rukuling supporting the hashit and vertices of my engloyees, Just as important to our mission of maintaining the highest quality of workmanship in the militagu bound aircrift that we proudly built, the health of our employees is also protont. Our employees rely on the pathership between management and the on-site medical team to all in preventing hearing loss due to loud noises in the workplace.

My emptyones use porumatio inveting tools to exerce metal alcoaft parts in place vahiph arrowfs flateness, which creates a lot oncise. Ensuring that the right heaving protection is worn, as well as the close monitoring of high risk employees who are intending band advances in the heaving, is assertial. Because of this monitoring, the mechanism with the heaving and extensions for programmed and the parts of the protection (who will be advanced and the second advanced advanced advanced protection) devices a second advanced advanced advanced advanced protection (who received advanced advanced advanced advanced advanced protection) device referring, and evaluation of their current use protection.

I feel that these early intervention practices have provided my employees with the assistance, guidance, and resources that they need in order to protect their hearing before they experience any changes in their hearing ability.

Mr. Mose Countryman Manager General Manufacturing

"These people are my friends and I want them to be safe"



- Phil Scala, Sr. Manufacturing Engineer

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Engaged Workforce in Safe Work Practices









Assessing Hearing Results in one Department Includes Retraining

Determining If Employee Is Maintaining Their Current Level Of Hearing

NORTHRO

EMPLOYEE	Employee hearing results show good hearing protection & practices	Employee <u>trending</u> toward negative shift in their hearing; re-evaluate their current practices to stop progression toward permanent shift	Employee has experienced a negative change in their hearing level that warrants retraining & refitting of hearing protection
Mike	Yes		
Tracey	Yes		
Trey	Yes		
Brad	Yes		
Jeremy	Yes		
Matt	Yes		
Justin		Yes ★	
Joseph	Yes		
Lucas	Yes		
Allen		Yes ★	
Tom	Yes		
Karissa	Yes		
Norman	Yes		
Jason	Yes		
+ Denotes re	eceived re-training/re-fitting		

Hearing Test History on Each Employee, Years of Data

Employee Hearing Test History and Focused Health Data

LartHam	FirstNam Birth	Smake	DH TYPE	irod Gond	las Clack	TestDe L5	LI	L2	L3 L4	L6	L\$ P	5 R1	R2	R3	R4 R6	R#																
	Aug-4	2		2E+07 M	186717	2E+07 15	25	30	45 55	55	25 5	5 65	70	90	*5 *5	60																
	Aug-4			2E+07 M	186717	2E+07 15	25	30	45 55	55	25 5	5 65	65	90	\$5 \$5	60																
	Aug-4	8		2E+07 M	186717	2E+07 15	25	30	45 55	50	40 6	0 60	65	85	80 85	55																
	Aug 4	*		2E+07 M	186717	2E+07 20	25	25	45 55	50	35 6	0 65	65	85	90 85	55																
	Aug-4	8		2E+07 M	186717	2E+07 20	25	25	45 55	50	35 6	0 65	65	85	85 85	55																
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	Aug-4	8		26+																												
	Aug-4	*		2E+					Emp	lowoo H	aning T	loct Hict			ad Haalth	Data																
	Aver4	8		26+					Emp	loyee n	caring i	est nist	Ory al	nu rocus	eu neaith	Data																
	Aug:4	\$		2E+																												
	Aug-4	8		2E+	LartHam	FirstNam Birth	Smaker	DH TTPE	tired Gen	les Cluck	TertDe	L5 L	.1 L	.2 L3	L4 L6	L8 R5	5 R1	R2	R3	14 R6	RS	1										
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	Dec-9	9 Y				Oct-1	59		2E+07 M	255406	2E+07	5 5				Jen-69		26+07	m	4954	a+07 1	5 15	25	39	39	50 50	1	5		5	5 4	5 10
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						Play	17 T		м	699769	- cL+07		_			0-14-83		2E+07	M	99662	2E+07 1	0 5	10	10	20	20 0	10	5	5	10	15	10 15
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Example Letter

- Example letters produced and discussed with respective employee (total of 5 for 2020).
- Standard threshold shift/s were discussed with emphasis on hearing protection device re-training, as well as education regarding the effects of accumulative noise on individual's hearing.

NORTHROP GRUMMAN

St. Augustine Aircraft Integration Center of Excellence Medical Clinic 5000 U.S. 1 North St. Augustine, Florida 32095

January 7, 2021

Hello Employee X-

Your audiogram results from your hearing test that we conducted in the Medical Clinic in <u>October</u>, 2020 have been reviewed by Dr. James Hall, Audiology Supervisor, with the following finding/s.

A standard threshold shift in your hearing <u>was confirmed</u> in your left ear, which indicates a possible hearing loss is present in that ear for sounds associated with speech and conversation. This change in your hearing level for your left ear may be the result of an unidentified medical condition, or a non-work place noise exposure activity.

Your current choice of a hearing protection device's offers you excellent hearing protection. Continue to wear your hearing protection when exposed to loud noise, whether at home or on the job. If you decide to change the hearing protection device's that was approved by the Medical Clinic for your use while at work, please contact us immediately so that we may retest you to determine if it affords you proper hearing protection.

It is recommended that you seek a referral to an audiologist for diagnostic assessment to rule out causes for left ear hearing loss that includes <u>of cocoustic</u> emissions testing and evaluation of speech perception in noise It would be beneficial if your assessment included recommendations for amplification (hearing agd) as well.

Regards,

D. Quinn Soudrette, RN

Providing recommendations and follow-up to those who shift (e.g., otoacoustic emissions, neural auditory function, acoustic reflex threshold/decay, etc.)



Corporate Wellness

- Corporate Wellness promotes best practices for health by providing services for
- Diabetes management,
- · Smoking cessation,
- · Weight loss, and more
- All these resources also promote hearing conservation



Early Detection of Noise-Induced Hearing Loss: Key to Successful Hearing Conservation

Distortion Product Otoacoustic Emissions (DPOAEs)

NORTHROP



FIGURE 1–4. A simple block schematic of the major regions of the auditory system that influence the measurement of otoacoustic emissions. Note the directional arrows in the middle ear depicting the bidirectional energy transfer through this space. The size of the arrows is representative of the relative magnitudes of the energy traveling into and out of the cochlea. Structures outlined in dashed lines play a secondary role in modulating OAEs.

LOOKING TO THE FUTURE



- You can never provide enough training
- Increasing the early detection of ear disease
- Excellence in our commitment to the warfighter begins with our employees, whom some are veterans that become part of our workforce. The mission is to protect and serve everyone's hearing and reduce, detect and educate any predetermined conditions.





NORTHROP GRUMMAN



Excited about our Hearing Conservation and our Site's success – **THANK YOU**

Julie Edwards Environmental, Health, Safety and Medical Manager Julie.edwards2@ngc.com 904.825.3536

