Finite Element Analysis of Bit Body

122-XS616-8-digit

ECO-PR-154616
Analyst: PGorade
GeMS #: 123456789 Rev -
Date: August 8, 2019

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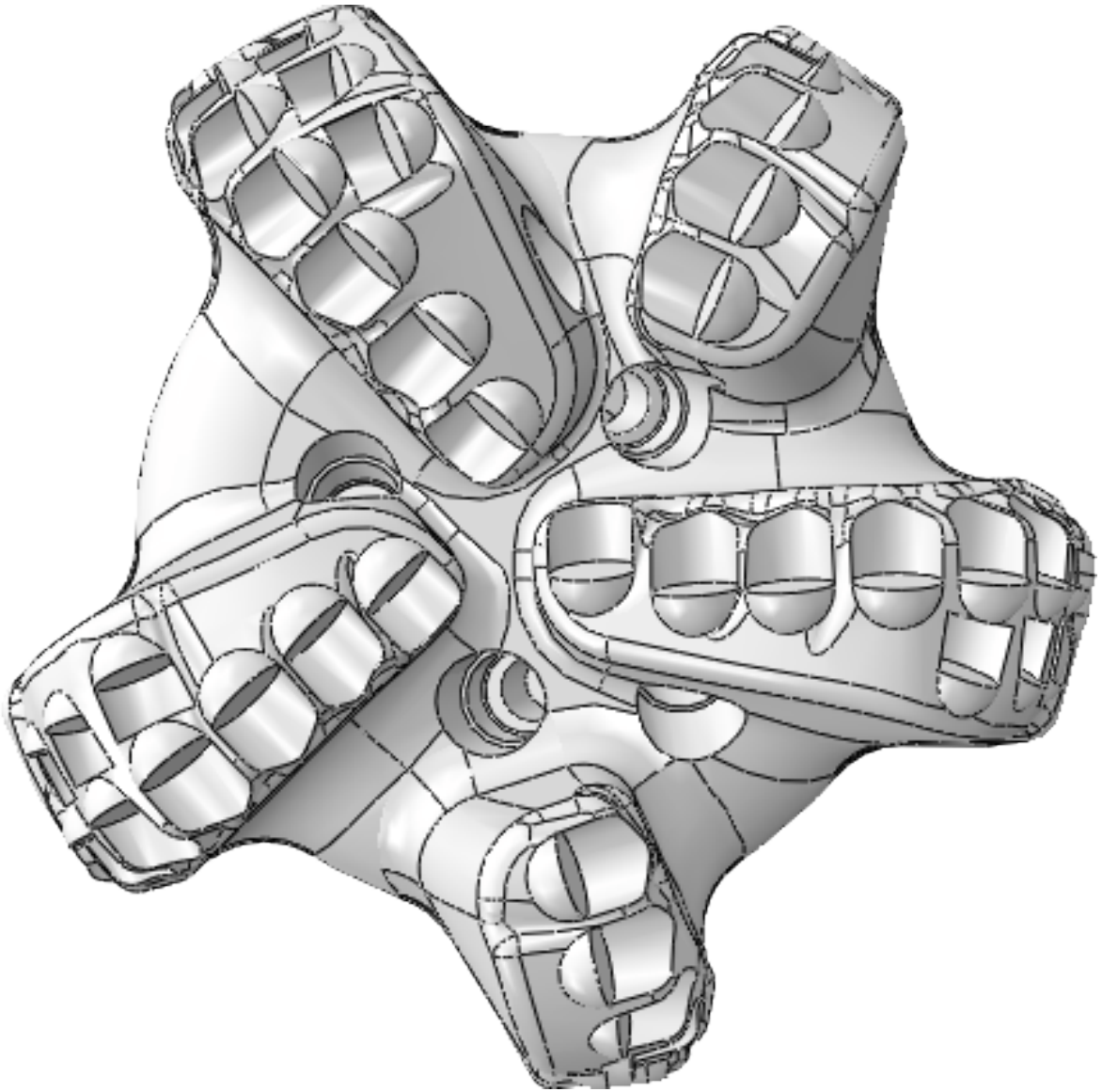
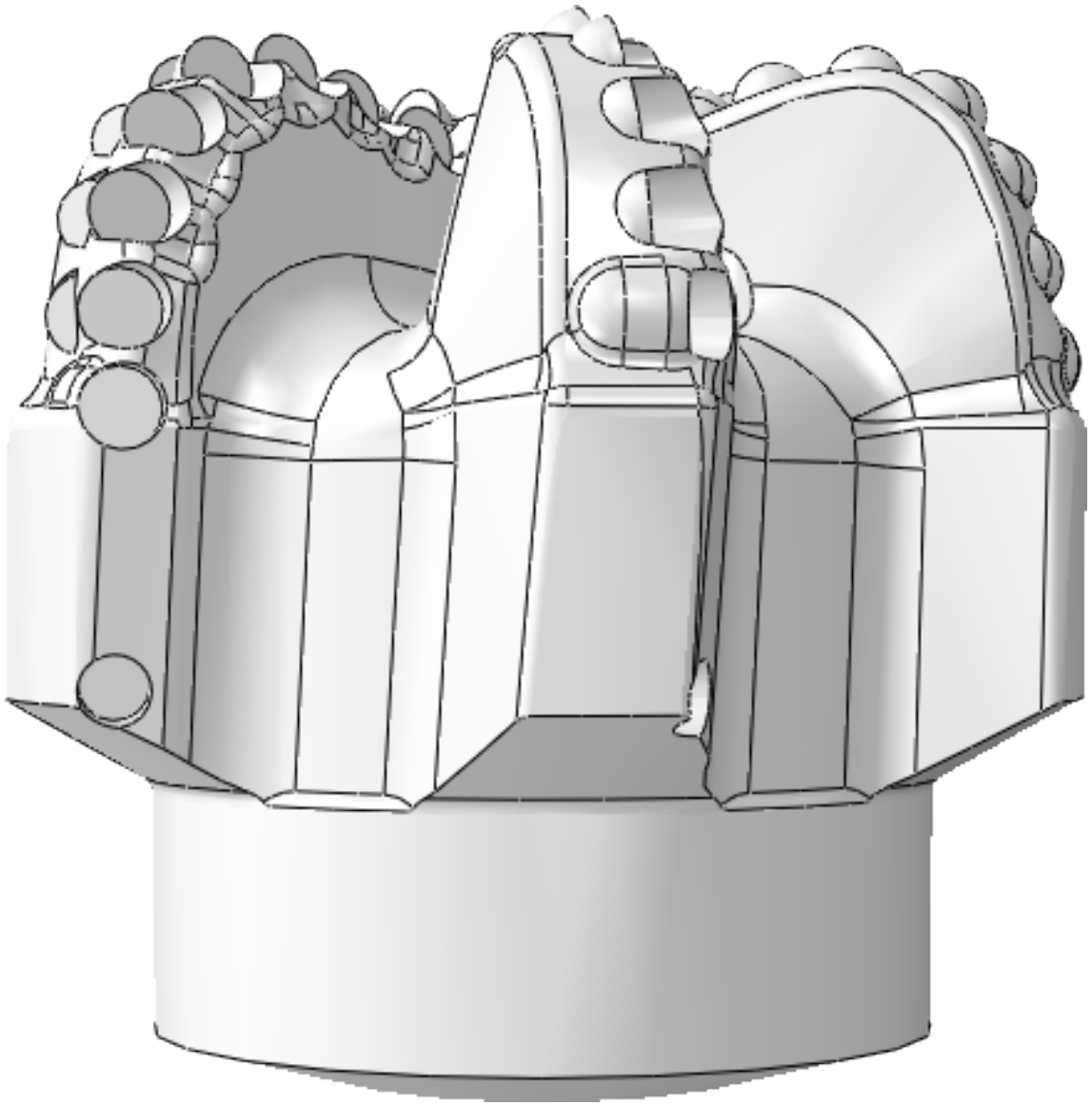
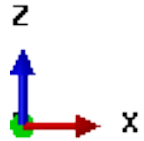
BitBody -FaceView

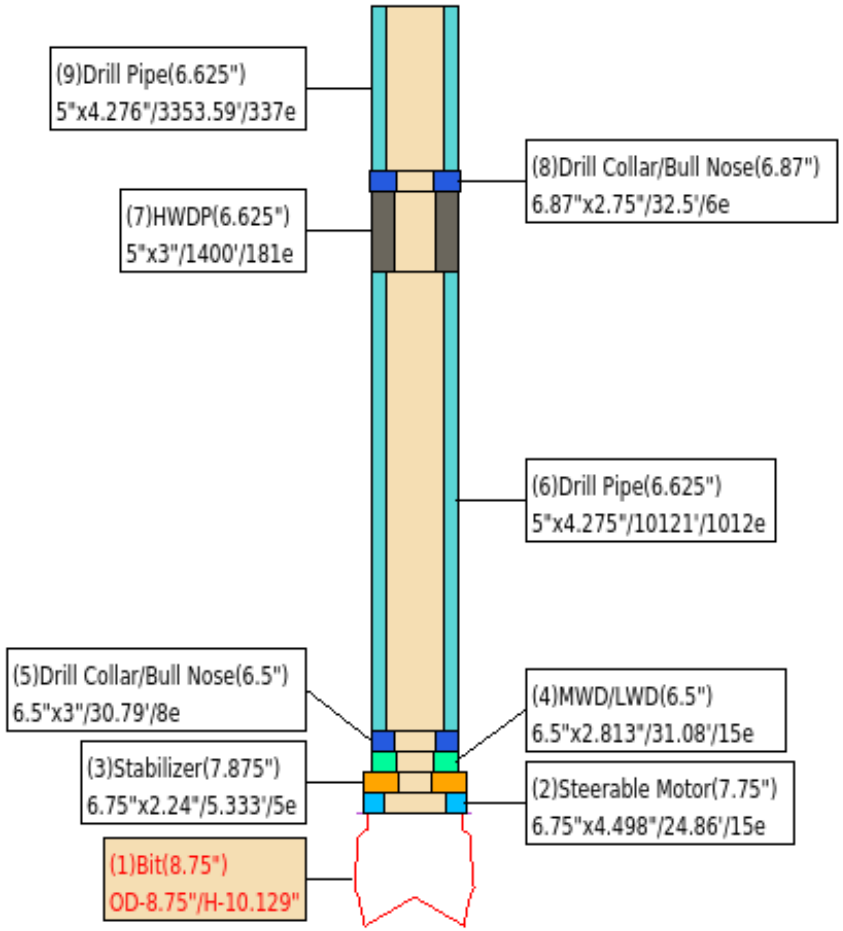


BitBody -RightView

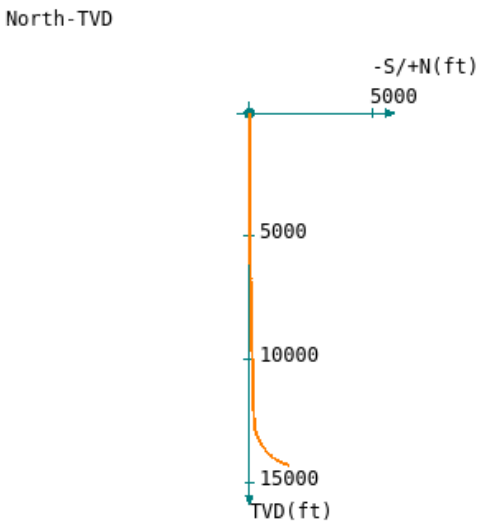


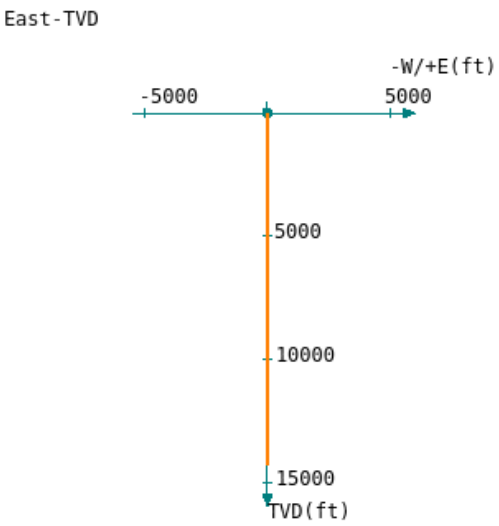


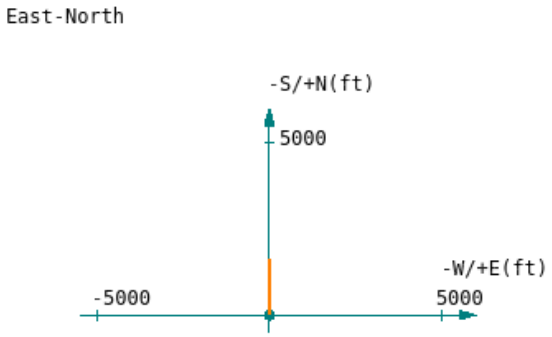
BHA

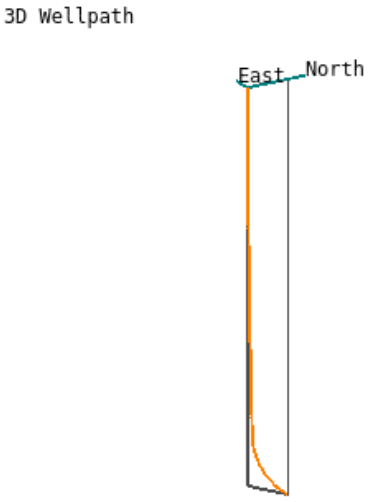

(9)Drill Pipe(6.625")
5"x4.276"/3353.59'/337e
(8)Drill Collar/Bull Nose(6.87")
6.87"x2.75"/32.5'/6e
(7)HWDP(6.625")
5"x3"/1400'/181e
(6)Drill Pipe(6.625")
5"x4.275"/10121'/1012e
(5)Drill Collar/Bull Nose(6.5")
6.5"x3"/30.79'/8e
(4)MWD/LWD(6.5")
6.5"x2.813"/31.08'/15e
(3)Stabilizer(7.875")
6.75"x2.24"/5.333'/5e
(2)Steerable Motor(7.75")
6.75"x4.498"/24.86'/15e
(1)Bit(8.75")
OD-8.75"/H-10.129"

Well


North-TVD
-S/+N(ft)
5000
5000
10000
15000
TVD(ft)


East-TVD
-W/+E(ft)
-5000
5000
5000
10000
15000
TVD(ft)


East-North
-S/+N(ft)
5000
-W/+E(ft)
-5000
5000


3D Wellpath
East
North

Formation And Running Parameters

Formation - Colton 3000

WOB - 45 - klbf

Total RPM - 180

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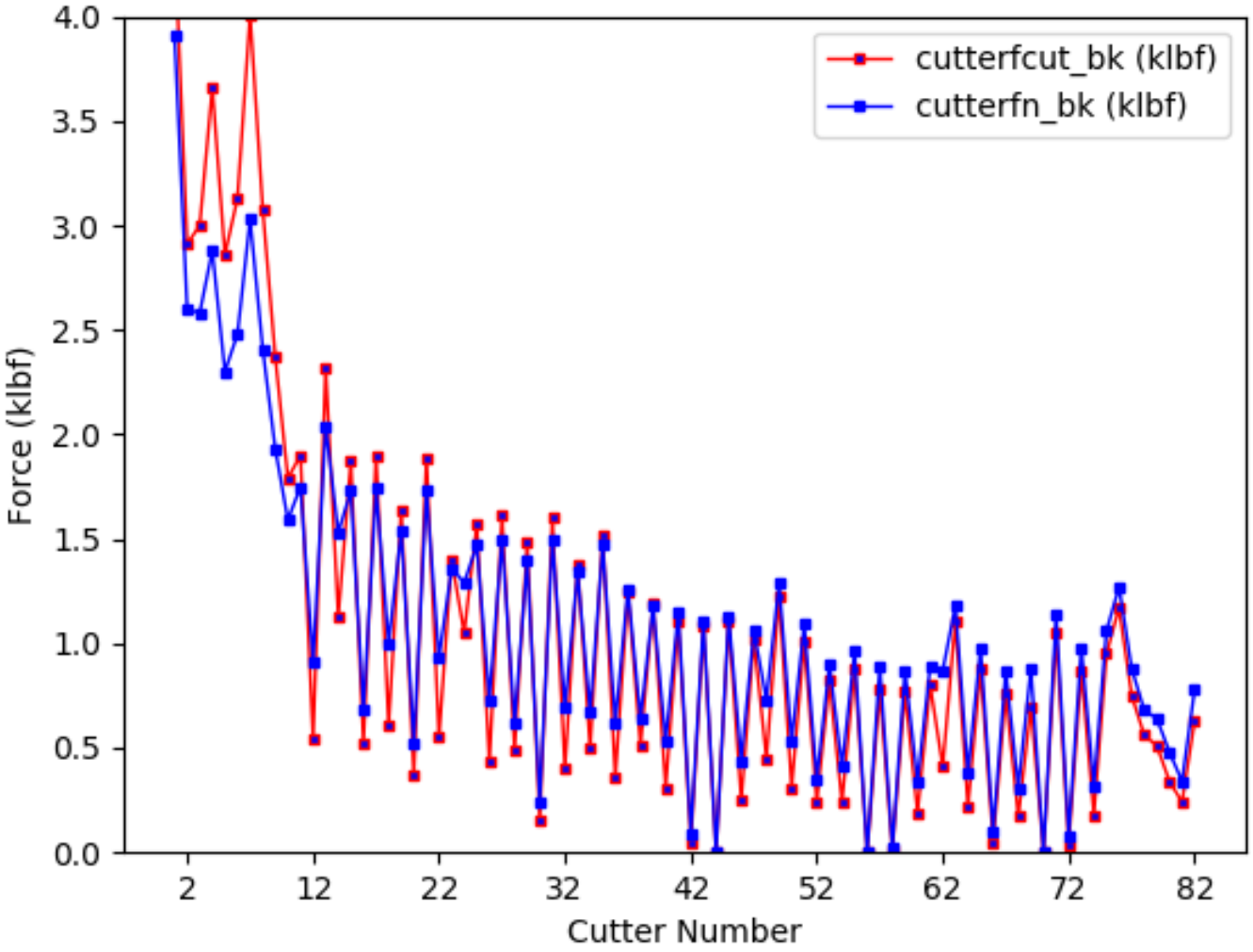
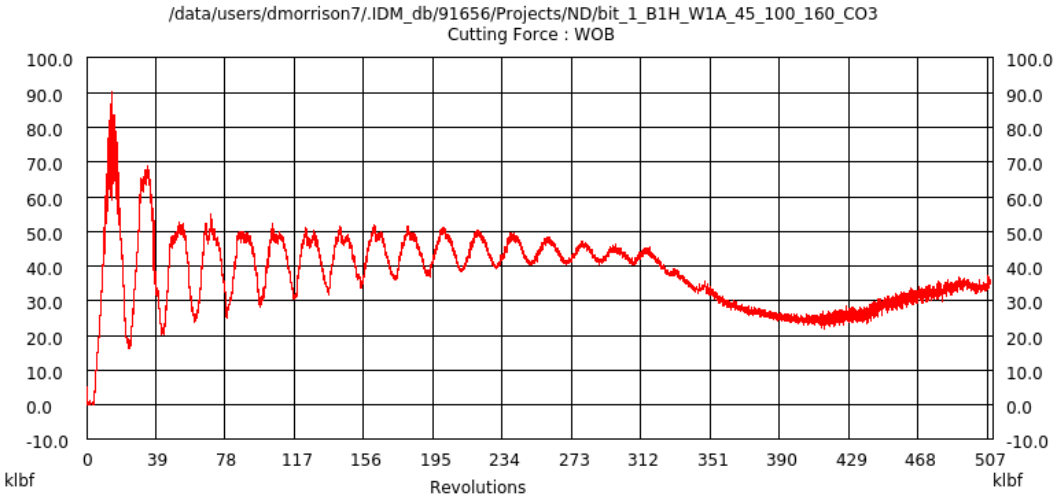
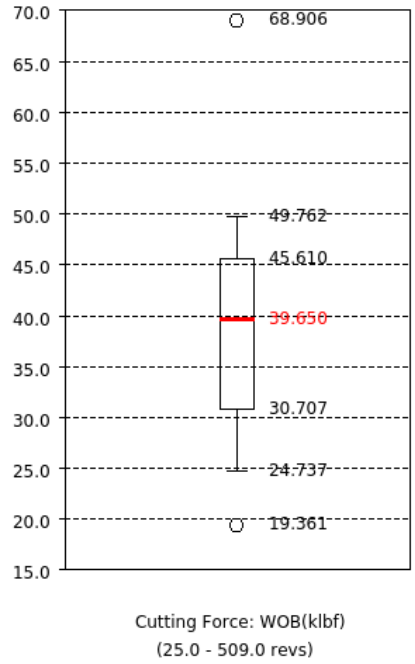
Cutter Force Distribution

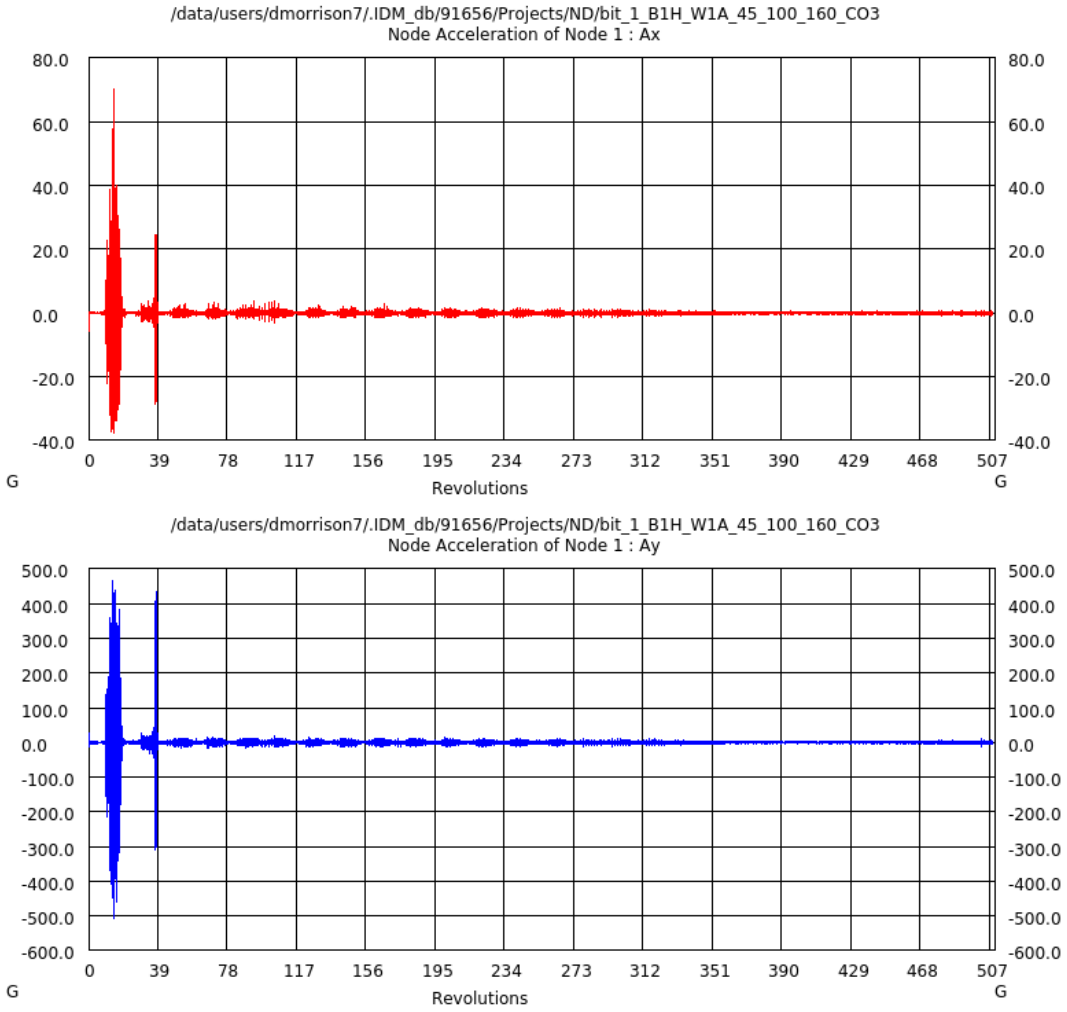


WOB


/data/users/dmorrison7/.IDM_db/91656/Projects/ND/bit_1_B1H_W1A_45_100_160_CO3
Cutting Force : WOB
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
-10.0
0
39
78
117
156
195
234
273
312
351
390
429
468
507
klbf
Revolutions
klbf

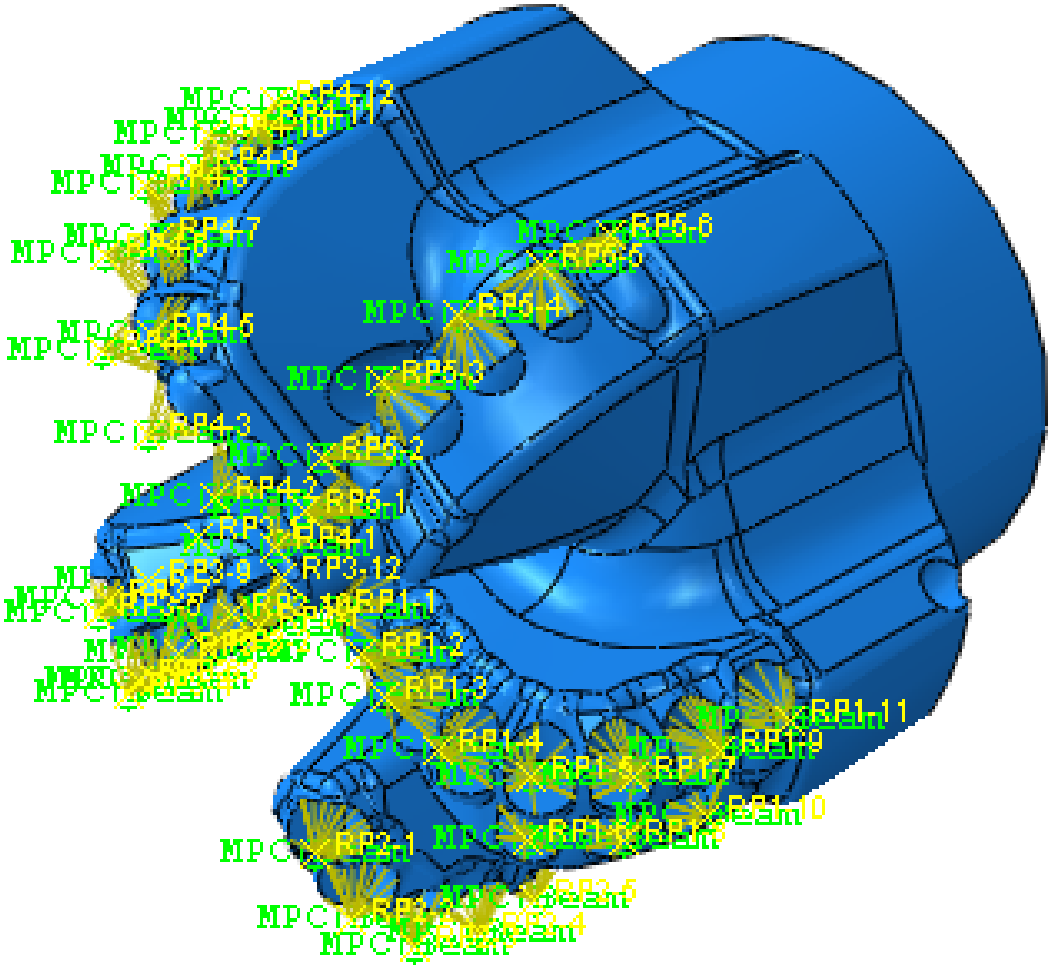

70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
68.906
49.762
45.610
39.650
30.707
24.737
19.361
Cutting Force: WOB(klbf)
(25.0 - 509.0 revs)

Bit Stability

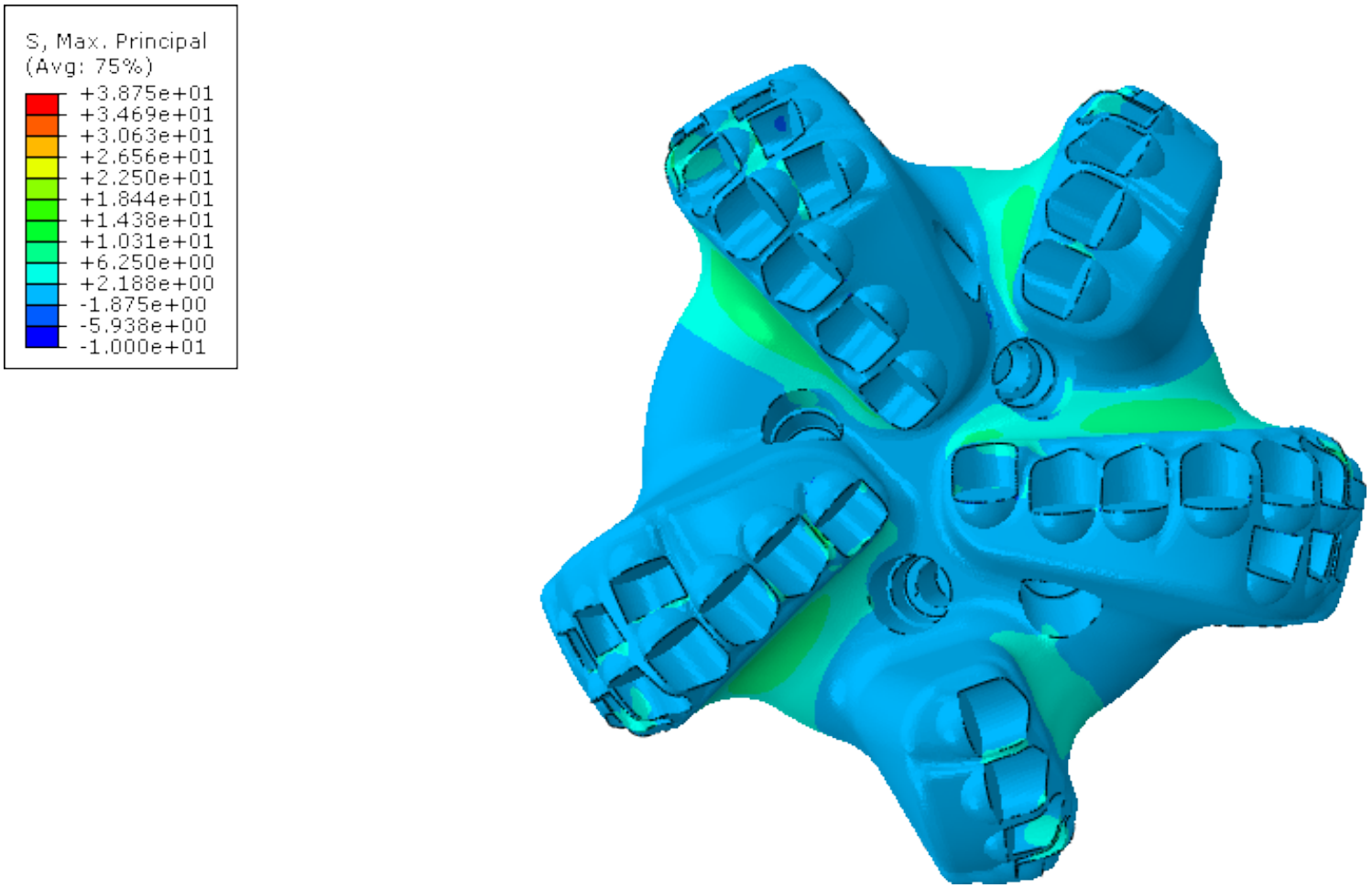


Mesh

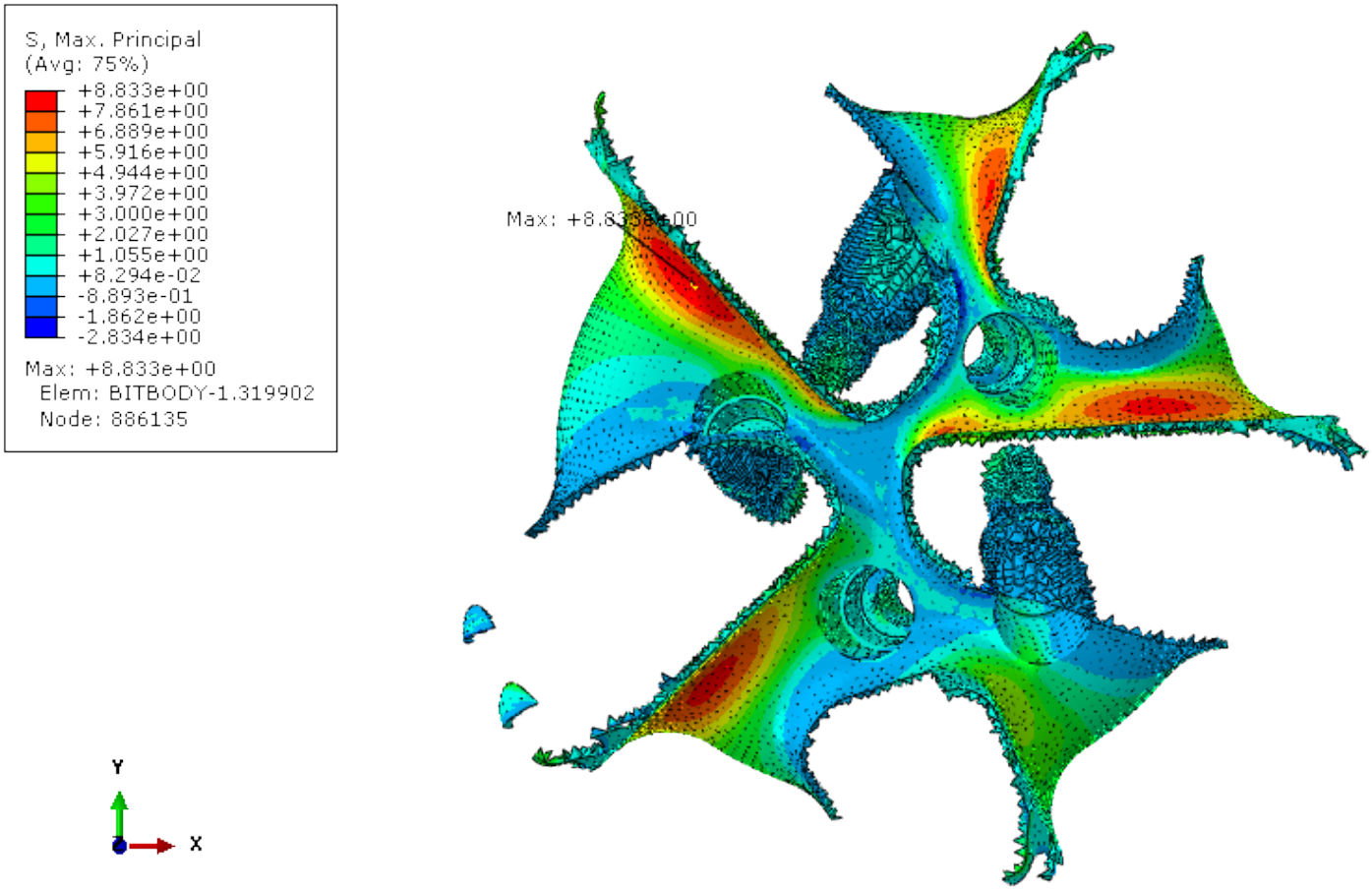
Loading And Boundary Conditions



Max. Principal Stress Plot



Max. Principal Face Stress Plot



Conclusions

Design Bit : 122-XS616-8-digit

Bit BOM : 8-digit

Material	Elastic Modulus (ksi)	Poisson's Ratio	Material Strength (ksi)	Limit Strength (ksi)
GM19+GB1	42,100	0.3	77.5	38.75

Max. Principal stress in the Model (ksi)	Result <PASS/FAIL>
8.83	**PASS**

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