1. **Engineering Group Interview summary of Empress of the North-**

The following is a bulletized summary of the interviews conducted by the engineering group on May 15 &16, 2007 onboard the Empress of the North. The group interviewed 4 members of the engineering staff, including: 1) the Chief Engineer: 2) the 1st Assistant Engineer (onwatch during the grounding); 3) the oiler on watch during the accident; and, 4) the 3rd Assistant Engineer.

1. Chief Engineer interview summary-
    a. 26 years old
    b. Holds 2nd engr unlimited license steam, motor, gas turbine
    c. Graduated Kings Point 2003
    d. sailed 2 years MEBA out of Houston, LA
    e. started Jan 2006 with Majestic
    f. worked in yard 2 months in March 2006
    g. sailed 3 AE 2 months
    h. sailed 1 AE, started CE Oct. 2006
    i. month on/month off
    j. been on 1 month this trip
    k. works 6 am to 6 pm
    l. assigns work to engine staff
    m. daywork
    n. off 6pm night before accident
    o. bed 10:00 night before accident
    p. asleep when ran aground, awoke , checked alarms in room monitor, no bilge alarms yet
    q. got dressed, started getting bilge alarms
    r. got radio
    s. ran to ER
    t. 1AE called, said ran aground
    u. 1 AE rings Engr assistance alarm
    v. 1AE calls all ER personnel
    w. CE to ER
    x. ordered staff to check tanks and close vents, trying to find what flooded and how much
    y. Capt. calls for abandon ship, for all pax to muster at stations
    z. started ballast pumps
    aa. deballasting voids known breached
    bb. checked fuel tanks, sewage, potable water tanks
    cc. started taking stbd. list up to 8 degrees before settling out
    dd. voids pressed after about 1 hr., water out of the vents
    ee. checking accom spaces, some flooding there, used portable pumps.
    ff. started launching liferafts
    gg. used fire/bilge pump crossed over to bilge/ballast system
    hh. 50 hp pump

ii. crossed mn. fire pump over to bilge system and used it, also ran bowthruster bilge pump
jj. bilge alm order, void 1,2,3, forepeak, chain locker
kk. once aground got forepeak alarm
ll. chain locker filled
mm. stayed in contact with bridge, letting them know spaces flooded
nn. also let them know all flooding status, and they would keep the bridge informed of any changes
oo. CE in contact with Capt and CM within 10 min.
pp. based all personnel out of OS
qq. center fuel tk.not breached, stbd fuel tank was breached- voids 1,2,3,& 4 breached
rr. used radio and phone to communicate- used the phone to avoid talking over those dealing with the evacuation
ss. deck using same channel,
tt. sent one unlicensed to sound tanks
uu. 2 & 3 AE's checking spaces, setting up pumps
vv. kept rechecking tanks
ww. stbd prop. drive, initially got alarm
xx. during event, bridge had control of prop.
yy. no stbd. prop alarms other than initial field voltage alarm
zz. also lo oil pressure flow
aaa. found no prop drive leaks
bbb. looked ok
ccc. once underway, had lo amps on motor
ddd. slight vibration
eee. shut down stbd prop.
fff. no problems with prop before accident
ggg. seemed like adrift, not hung up
hhh. heard they had drifted whole time
iii. have 3 generators on line, typical for running full
jjj. had 3 on for 2 hours after aground, shut one down
kkk. to save fuel
lll. was not directed involving evacuation
mmm. some unlicensed helped while out checking spaces
nnn. gathered they had to cut some liferafts off
ooo. after grounding, prop was down to zero, with z drives opposed, throttles at zero, bow thruster at zero, when C/E got to OS
ppp. leading up to grounding, run 60 percent with 3 generators online
qqq. after accident, 26 percent load
rrr. after accident, noticed all watertight doors shut.
sss. not shut while operation
ttt. watertight door 1 is kept shut during operation- #1 is bowthruster door
uuu. all doors closed by the time he was dressed
vvv. thought they were sitting on a rock for about 2 hrs.
www. also closed all tank vents to seal tanks- wedged goosenecks closed

xxx. bags over fuel vents in case of fuel spill
yyy. found leaks in void 3 sumps between watertight doors 5 and 6
zzz. holes in officer mess
aaaa. hole in void 3 screw holes in wall
bbbb. water leaking through wireway packing between watertight doors 5 and 6
cccc. between watertight doors 3 and 4, by void one, a manhole cover was leaking
dddd. around gasket, could not tighten enough to stop it
eeee. manhole cover gaskets last checked in Jan or Feb.
ffff. checked during drydock
gggg. void 4 penetration had a penetration to void 3, leaking through the sewage pump room
hhhh. had to pump this room every 30 minutes
iiii. very slow leak
jjjj. generators never lost cooling water suction
kkkk. no ER space pentrations
llll. run emerg. generator 2 hrs. every month, test for loss of power
mmmm. never lost power, emerg. gen never started
nnnn. fuel tanks- 3 forward of void 1, between ballast tanks
oooo. void one had 3 tanks across
pppp. port and starboard fuel tanks had been stripped previous week
qqqq. ctr. tank could run ship for a week
rrrr. port and stbd stripped as a precaution
ssss. checked BT, no flooding in space or framing
tttt. sewage and potable water tanks ok, no loss or gain
uuuu. checked potable water for chlorides, less than bottled water
vvvv. 1 AE and oiler on watch during grounding
wwww. 3 days previous to accident worked 6-6, normal sleep routine
xxxx. worked during yard period following last marchs grounding
yyyy. as dayworker
zzzz. that grounding damage consisted of replacing 80K pounds of steel
aaaaa. some upsets
bbbbb. damage on stbd side
ccccc. no prop side
ddddd. occurred in Columbia river
eeeee. have sms system
fffff. use standing orders
ggggg. not sure if sms has procedure for groundings
hhhhh. bilge and ballast pumps started after CE arrived in OS, started pumps on his own
iiiii. during time pumps were running bridge called a couple of times to see if list had stabilized and if still taking on water
jjjjj. maintain tank sounding logs, last taken midnight before
kkkkk. tank level indicators in void 1, potable water and fuel tanks lost power, shorted out

lllll. shows in logger when they went out, not recorded by hand
mmmmm. automation otherwise was functioning properly
nnnnn. eventually, power to bilge alarm controls junctions went out due to shorts.
ooooo. by the time the cabinets with the junctions boxes shorted, we had a good handle on the control of the flooding
ppppp. never been involved in sms audits
qqqqq. wing fuel tanks emptied wk. prior to grounding, called randy for permission, randy ok'd
rrrrr. has direct access to dp or port engr
sssss. paddle wheel powered by dc motor
ttttt. throught gearbox reduction
uuuuu. paddlewheel not working during accident, free spinning
vvvvv. paddlewheel generally not used, 1000 hp motor, inefficient
i. direct drive through reduction
wwwww. 1 ae first called him on phone, not radio

2. First Engineer (on watch) interview summary-
    a. generally works 6 am to 6 pm
    b. dayworker
    c. day of accident was standing midnight to noon
    d. watch schedule- 3rd engr stands midnight to noon
        i. 1AE works 6-8 am maintenance
        ii. takes watch from 8 am to 4 pm
        iii. works 4 to 6 pm daywork
        iv. 2 engr works noon to midnight- he works daywork noon to 4 pm assumes watch at 1600.
    e. all engineers work 4 hours maintenance and 8 hrs. of watch
    f. other duties include managing personnel, assign task, assign watch schedule
    g. 1st engr was standing watch night of accident cause new 3rd engr was fresh out of school, didn't want him standing watch by himself
    h. that way new 3rd could work with other engineers familiar with vessel
    i. new 3rd joined vessel saturday
    j. was on watch with oiler during accident
    k. took midnight watch saturday night because of new 3rd.
    l. night of accident had numbers 1,2, and 3 running.
    m. everything seemed normal
    n. early in watch troubleshooting problems with oiler on blast chiller
    o. checked galley and OS
    p. made round of ER
    q. everything was fine
    r. at 0130 in ER talking to oiler about blast chiller, ran aground, extreme noises
    s. instant bilge alarms
    t. stbd z drive alarm

u. called Ch. Engr
v. told him we're hard aground
w. sent oiler fwd to check for water coming in
x. also for him to check fuel oil tanks
y. did not assist in pax evacuation process
z. holds 2nd engineer unlimited license and near coastal chief engineer's license
aa. maine maritime graduate in 2003
bb. worked for Global Sante Fe for 1 year on Glomar Explorer
cc. with USS shipping for 3 yrs. on ITB's
dd. started with Majestic on July 25, 2006
ee. was onboard for several near misses, navigational
ff. periodically checks alarms & safety equipment
gg. started with Majestic as 3rd engr, moved to first engr on Nov 5, 2006
hh. didn't call bridge after accident, more concerned with waking engine personnel
ii. set off engineers assistance alarm
jj. he and chief gave staff orders
kk. captain and chief mate were periodically calling down
ll. after getting bilge alarms (chain locker, forepeak, void 1), got high armature volts, low lube oil flow on stbd z drive thruster
mm. no problems with port z thruster
nn. no propulsion problems before accident
oo. bow thruster was not online, but started and passed it to bridge immediately after grounding
pp. sounded engr assistance alarm after calling chief
qq. made last round at midnight, all operating normally
rr. Running 700-900 RPM at time of grounding
ss. assisted in closing tank vents
tt. all tanks were sounded at midnight
uu. sewage and potable tanks are not sounded, use tank level indicators
vv. after grounding, tested potable chlorides, 15 ppm, control level is 40 ppm= bottled water
ww. Oiler did first check of void 4-Sunderland
xx. at time of grounding, no bilge or ballast pumps, or fire pumps running until immediately after grounding
yy. paddlewheel was freewheeling
zz. watertight doors closed after grounding
aaa. got a lot of alarms due to shorted connections in bilge system
bbb. 10-12 degree list within one hour
ccc. could hear air rushing from manhole cover in room 19
ddd. lasted a couple of hours, I was worried
eee. constantly monitoring list
fff. list decreased after about 3:30-4:00 am as passengers were being evacuated
ggg. listed to starboard

hhh. when grounded, heard a lot of strange grounding, growling, nasty, vibration like we just ran over an island
iii. went the whole distance of boat, "the whole entire distance"
jjj. were on pilothouse at time of accident
kkk. propulsion went slack immediately after hitting and remained there a long time.
lll. noises lasted about 5 seconds
mmm. propulsion working without problem previous to accident, no issues
nnn. ran 2 generators instead of 3 at lower speeds
ooo. in charge of scheduling engine maintenance
ppp. maintenance was up to date, both weekly and monthly
qqq. 30 years old
rrr. data logger time was correct to local time
sss. after accident, slow steam to dock, had some vibration, lifted deckplates, couldn't see anything from ER
ttt. slowly increased speed on the way back
uuu. no sign of structural damage
vvv. stbd zdrive pulling a lot less current
www. shut down stbd z drive about 15 minutes into return transit, about 5:30
xxx. returned to port with only port z drive
yyy. stbd z drive turned back on for docking
zzz. main drives were left online the entire time after grounding, also the bowthruster
aaaa. bow thruster used primarily only for docking.

3. Third Engineer interview summary-
    a. 21 years old
    b. graduated cal. maritime academy 4/28/07
    c. maritime engineering technology major
    d. first ship
    e. signed on vessel may 13th
    f. upon signing on, 2AE showed him around ER and ship, safety equipment, emergency billet location
    g. stood first watch alone today, midnight to noon
    h. 3 previous days stood watch with 1AE 6 am to 6 pm
    i. learning plant by 1AE
    j. 1AE signed him his schedule
    k. was sleeping during grounding
    l. awoke about 1:30
    m. jumped up, roomed with 2AE
    n. got dressed
    o. heard capt on pa telling all to don lifejackets, and go to main deck
    p. went to main deck
    q. there told to go to emergency station

r. went to OS operating station
s. CE directed him to start pumping voids
t. void across from his room was venting air, his room was 18
u. as directed
v. used double diaphragm to pump spaces per CE
w. used fire and ballast pump to pump void, attempted
x. used bilge and ballast as well
y. smaller diaphragm pump also
z. didn't use submersible pump
aa. didn't hear engrs assistance alarm
bb. went up port side ladder to main deck
cc. with 2 AE
dd. when he arrived in OS, also there were: 1AE, oiler, maint, and other oiler.
ee. CE directed personnel in emergency
ff. read standing orders after coming aboard
gg. never received paperwork from CE regarding familiarization
hh. familiarization with 2 AE lasted a few hours
ii. hired through job fair at school
jj. responsible for lifeboat maint- battery condition, running weekly,
kk. also watertight door maint.
ll. had monthly maint. checklist
mm. all watertight doors working ok
nn. was comfortable with plant by time he was on alone
oo. 1AE made sure he was comfortable with being on watch alone
pp. had reviewed daily, weekly, monthly maint sheets
qq. responsible for rescue boat maint.
rr. good working relation with CE and 1AE
ss. holds 3AE license for stm., motor, and gas turbine
tt. new maint. computer program, as well as paper copy, maint. items have to be signed as well
uu. 1AE additionally puts out day maint items as they become necessary.
vv. was on watch previous to grounding 6-6
ww. everything was running normal.

4. Oiler (on watch) interview summary-
    a. 33 years old
    b. 5 yrs. marine corp
    c. started sailing passenger vessels 5 yrs. ago as bartender
    d. moved to oiler on American queen, back to oiler
    e. been on this vessel since feb 1st of last year, as first maintenance, then oiler
    f. been oiler since September
    g. been on this trip since Ketchikan, about 1 and a half weeks
    h. work 6 pm to 6 am, assist engr on watch
    i. duties to assist watch engineer as necessary
    j. conduct routine maint during watch

k. came on at 6 pm night of accident, previous
l. normal watch up to grounding
m. 1AE relieved 2AE at midnight, all normal conditions
n. worked on blast chiller with 1AE for an hour or so
o. discussing blast chiller at time of accident in OS
p. extreme jar, hit something
q. few seconds before first alarms
r. felt kind of like “last time”
s. first bilge alarm was void one
t. 1AE sent me fwd to see if water coming aboard
u. on his way to void, heard capt on 1NC asking crew to come get dressed and come topside with lifejackets.
v. starting banging on doors waking crew
w. deckhand told him water coming in room 19, void hatchcover had buckled
x. assisted deckhands in getting pump to it, told them not to open hatchcover
y. sounded tanks at instruction of CE
z. banged on CM and exec chef doors
aa. was onboard last grounding about 1 year ago
bb. got pushed out by a barge, his understanding
cc. vessel was OOS for 2 weeks
dd. on as maintenance
ee. thought everybody did a great job
ff. capt kept crew and passengers informed
gg. CE very calm
hh. engr completes log
ii. does not make set round times
jj. didn’t hear engr assistance alarm
kk. called CE after grounding
ll. also checked bowthruster space,no water
mm. licensed engr makes numbers round for logbook
nn. has PM schedule he is responsible for
oo. has weekly, monthly, and quarterly PM to take care of
pp. did not pump water, instead checked spaces
qq. one oiler, one QMED, and one maintenance man for unlicensed
rr. maint man stands 0900-2100 daywork/watch, including hotel maint.
ss. reports directly to watch engineer
tt. machinery condition is quite well, no major problems
uu. no daily or weekly problems
vv. all equipment working aside the blast chiller
ww. 1AE assigns maint
xx. also PM book
yy. keep work log book, have to sign off on PM

PM system is SINEX