good afternoon everybody from the
Johnson Space Center here in Houston
Texas I'm NASA's Josh Byerly we're going
to be taking a look today at a spacewalk
that is planned for November first where
Sonny Williams and Aki Hoshide will
step outside to the p6 radiator and
correct an ammonia leak that has been
spotted out there on the very end of the
station's truss structure here to give
more details about all this activity
is the International Space Station
program manager Mike S. Eenie as
well as Mike Lammers who is the NASA
flight director who will be inside

Mission Control during the activities as

well as Allison Bollinger a spacewalk

officer who she and her team had

choreographed the activities for sunny

and hockey we'll get started with Mike

well good afternoon is just said we're

here to talk to you today at the outset

of a an EV a we have been working on a

number of power problems over the last

several weeks if everyone's been

following along we had the three a solar

array set was not in the in the mix for

all of the power providing capability
00:01:07,399 --> 00:01:11,750
that the space station had because of a

30
00:01:09,530 --> 00:01:16,129
short that we experienced several weeks

31
00:01:11,750 --> 00:01:19,069
ago the team over the course of a number

32
00:01:16,129 --> 00:01:22,849
of days slowly reintegrated that system

33
00:01:19,069 --> 00:01:26,688
into into the set and its back with us

34
00:01:22,849 --> 00:01:28,750
now we actually don't know the root

35
00:01:26,688 --> 00:01:32,538
cause we believe the root cause to be

36
00:01:28,750 --> 00:01:36,858
perhaps the short of a one of 82

37
00:01:32,539 --> 00:01:40,189
capacitors in the in the SSU as a result

38
00:01:36,858 --> 00:01:43,188
of that short it's we believe that we we

39
00:01:40,188 --> 00:01:46,309
basically burned out the capacitor and

40
00:01:43,188 --> 00:01:48,618
and so now the short is gone the system

41
00:01:46,310 --> 00:01:52,670
the capacitors use for power power

42
00:01:48,618 --> 00:01:54,500
quality purposes and missing one of 82

43
00:01:52,670 --> 00:01:57,409
will not really affect the power quality

so we're believe we're in a good place

with the three array and now we have all

eight channels providing power to the

ISS that's the good news the bad news is

over the last several weeks we have been

watching well the p6 array since it's

been on orbit has had a very very slow

leak that we have

monitoring as you may recall about a

year ago we recharged one of the systems

out there because of this leak that's a

normal capability that we have on ISS

the leak is is amazingly slow you

couldn't see it if you were sitting on
top of it and so really the better part of valor is just let the system slowly leak down and recharge it as we've done that process was to occur about once every four or five years and since we're outside for EVs every soften anyway that was the right position to be in however in about the June timeframe we noticed that the leak rate picked up substantially and and over the course of and I say substantial again you're talking about a very slow leak in terms of leaks in general and so it takes it takes several weeks if not months to
decide exactly what the leak rate is in

a system like this that also not only is

it got a very very slow leak we go

through temperature changes regularly in

these loops and so it's very hard to get

the actual leak rate without quite a bit

of trend data but anyway over a two or

three months we determined that the leak

rate was such that would get low enough

that the system would shut itself down

probably in the late december early

january time frame since that time as

we've continued to watch the leak it

looks like we could probably go another
month or two but but the data does indicate that we're going to leak down to a point where we will eventually have the system will shut down to protect itself and so the decision has been made to go ahead and send Sonny and naki outside we don't know exactly where the leak is it's possible the leak is in the PBR itself the radiator itself it could be in the pump system or it could be in any one of the lines and so a leak rate this small it's not like you can just take something out of the set while the crews outside and then
have them wait a couple minutes and you

00:04:18,319 --> 00:04:21,889
see where the leak is fixed or not and

00:04:19,850 --> 00:04:23,599
then you go work on the next thing as I

00:04:21,889 --> 00:04:26,060
said before it takes weeks maybe months

00:04:23,598 --> 00:04:28,279
to see if you've affected the leak rate

00:04:26,060 --> 00:04:32,540
so the first thing we're going to do

00:04:28,279 --> 00:04:35,409
and we'll talk about it more here with

00:04:32,540 --> 00:04:38,750
the folks on the panel with me but the

00:04:35,410 --> 00:04:41,330
object here is to go hook up to another

00:04:38,750 --> 00:04:44,300
array we have that's out there on the p6

00:04:41,329 --> 00:04:46,939
truss and was utilized as we call it the

00:04:44,300 --> 00:04:48,560
early system way back in the in the day

00:04:46,939 --> 00:04:51,709
when we first started flying the space

00:04:48,560 --> 00:04:53,360
station and and then see we can operate

00:04:51,709 --> 00:04:54,799
the loop this way so we'll operate the
channel this way and see if the leak stays with us or not and then based on what that tells us will decide if we have to do anything else outside it's conceivable that if the leak is in the radiator itself we could just stay in this configuration and operate off the off the radiator that's was originally intended for the ammonia system so that's what we're going to go outside to to tackle here in the next few days actually November first between now and then of course we've just got the next crew on board
with us the next crew and fish are on board with us and everyone is doing well including the fish we have our next major operation on board ISS is the return of the Dragon capsule that returns on Sunday would I think we release at about 8 26 in the morning central time Sunday and it lands or splashes down I think about to 20 ish in the afternoon that day at least that's the current plan so this all occurs on Sunday then right before the EBA on the thirty-first of 49 progress will launch into a four orbit rendezvous with
station and so it'll launch and dock on the 31st and then of course the next day after that we'll do the EBA so we got a pretty busy period but this is the right time to do this EV a sunny and Aki both have just been outside the suits are all size for them they have experienced course very recent experience outside sunny actually helps stow these these particulars particular radiator that we're going to deploy and has quite a bit of experience with these cuties that we have to manipulate outside and so for those reasons we think it makes sense to
go ahead and let them go out

00:06:41,240 --> 00:06:45,800
go ahead and let them go out

for they come home and take care of this

00:06:43,550 --> 00:06:47,810
for they come home and take care of this

for us so that's that's the that's the

00:06:45,800 --> 00:06:50,120
intent so with that I'll hand it off to

00:06:47,810 --> 00:06:56,300
my cool get go into more detail on the

00:06:50,120 --> 00:06:58,490
my cool get go into more detail on the

on the VA okay thanks Mike Evie a 20

00:06:56,300 --> 00:07:01,370
on the VA okay thanks Mike Evie a 20

will be on Thursday november first as

00:06:58,490 --> 00:07:04,069
will be on Thursday november first as

Mike mentioned the egress will be at 715

00:07:01,370 --> 00:07:06,139
Mike mentioned the egress will be at 715

a.m. central time and e VA is expected

00:07:04,069 --> 00:07:10,009
a.m. central time and e VA is expected

to last nominally about six and a half

00:07:10,009 --> 00:07:12,299
to last nominally about six and a half

00:07:12,299 --> 00:07:17,330
hours just a review of our crew that's

00:07:14,269 --> 00:07:19,848
hours just a review of our crew that's

on board we have Sonny Williams aki

00:07:19,848 --> 00:07:25,668
on board we have Sonny Williams aki

hoshide a and yuri malenchenko and they

00:07:25,668 --> 00:07:29,529
came up on soyuz tma 5m which was

00:07:29,529 --> 00:07:33,529
came up on soyuz tma 5m which was

launched on december sorry july
fourteenth dr. oz fete on july

seventeenth and the e VA will occur in

their 107th day on board of ISS and of

course that we just acquired a new crew

with Kevin Ford Oleg novitskiy and

Evgeny tarelkin and they launched on

Soyuz TMA 6m back on the twenty-third

they docked to a post yesterday morning

and the VA will occur on their seventh

day in space just to review the current

configure the vehicle actually the

configure the EV a progress 48 will be

on the nadir side at the Pierce docking

module Soyuz TMA 5 m-f as I mentioned is
at Ross fête on the native side of the

FGB Soyuz TMA 6m is docked at poisk and

progress 49 will arrive at the sm after

about 24 hours before the EBA and that's

again a 4-bit launch and dock just kind

of an overview of the power system

onboard ISS and Mike did a really

excellent job of kind of describing the

issues that we're working with the we

have eight power channels on board the

ISS and it's basically one for each one

of those solar arrays you see and of

course as we go through the Eclipse

period in the orbit we we have a pretty
good complement of batteries and other equipment that gives us power when we're going through the Earth's shadow each one of those eight channels has its own cooling system and it's actually separate from sort of the big cooling systems on board the vehicle that we had to repair with an e VA a few years ago I call it sort of the little brother there's eight of them each one consists of a pump also known as the PFCs the pump flow control system that's got a pump in some valves in it there's a radiator to a coolie ammonia and you can
see that going out towards the bottom of
the screen there and then a series of
tubes and cold plates to to pick up the
heat each photovoltaic module p-6 p 4 s
4 and s 6 each has to power channels and
as I described to photovoltaic thermal
control systems and their separate
there's eight of them but kind of one of
the details is that radiator is shared
between two systems so what you see
there with that one radiator it's got
the tubing for all a p6 for both the two
Bravo power Channel which we're looking
at fixing here in four Bravo and so that
systems are separate but they go through
that same radiator again we mentioned

the two Bravo's on p6 that's way out

there on the port side and that was the

first array that was launched a number

of years ago and if you remember it

actually used to live up on the zenith

side of the vehicle and and we move that

from the top of the z1 trust and the

zenith out to the end of the p5 where it

currently lives as part of a sts-128

over of 2007 so as Mike mentioned you

know we've had this very slow leak on

the pv TCS since 2007 and again I like

to sort of characterize it as as a
leak that I had my air-conditioning system a number of years ago where it's about every two years I got to put more freon on the system and it's not something that's immediately obvious and again something if it's slow enough that we can go ahead and feed and if you go ahead and look at the next slide here this is actually a really good comparison of the two Bravo channel which is the one with the leak and the four Bravo which is in blue and it's been tight and you can see that we normally run just over 50 pounds of
ammonia in the system and you can see as

we trend it out over several years we

have a very slow leak and again it's

really you need to look at it over weeks

and months to sort of determine what the

trend is you can see over there towards

the right where we actually did the

recharge on sts-134 and that was done on

EV a 2 with drew Feustel and mike fink

they put eight pounds into the system

both Joe and Mike have been really a

great asset they've been helping us a

lot with this e VA and Mike will

actually be the Capcom during the EV a

11:53,870 --> 00:11:57,919
great asset they've been helping us a

12:01,070 --> 00:12:06,470

lot with this e VA and Mike will

12:04,099 --> 00:12:06,470

actually be the Capcom during the EV a
sitting to my right again you can see on

the right side of that that we saw an

increase in the rate and you know if you

look at the conservative sort of worst

case as Mike mentioned of you in early

next year that we'd hit the minimum they

tell me the minimums about on that chart

calibrated to that chart is about 40

pounds and again it's it the trick is it

it takes some time to to trend that line

and figure out where it's going so kind

of on a big picture of the EV a and

alison has got some great graphics that

she'll go through but again we mentioned

that the leak is most likely in either
the PFCs the plump full control system

or the radiator they're both of our use

ey both can be isolated from the

they both can be isolated from the

systems we're real suspicious of the

radiator just because of you saw it kind

of stretches out there and it's

susceptible to micrometeoroid impacts

and again the goal of this e VA is to

isolate the PVR from the system by

closing an EV a actuated disconnect you

know what by doing that and kind of

watching the quantity that's in the

radiator that's cut off from the rest of

the system as well as the remainder of
the system we can kind of determine if

that lee

because in the PVR the PFCs side as as

Mike mentioned we have a spare radiator

in the way that we'll use that spare

radiators will will use these jumpers

that we're used to help fill on 134 and

we will connect up that spare radiator

to the two Bravo cooling system and

those jumpers are actually dry now

there's no ammonia in them we'll just

get them into the right position and

we'll go ahead and open them up and that

will just tie the current cooling system
to that extra radiator that we have that spare radiator again was part of the old ETCs or the early external thermal control system that was used primarily when that trust was up on the zenith side of the vehicle we deactivated that in the winter of 2006 and during an EV a7 we put that radiator away that EV a was done by Mike Lopez allegria and conveniently enough Sonny Williams who will be doing this eve EA and it's been real helpful to get her take and what she remembers and it's he remembers quite a bit about the work
site and her experience with putting

00:14:41,600 --> 00:14:50,870
that radiator on away and we it's just

00:14:49,340 --> 00:14:52,310
real nice video of course we'll be going

00:14:50,870 --> 00:15:00,379
in the reverse direction when we do the

00:14:52,309 --> 00:15:08,639
e VA itself maybe but again if the leak

00:14:55,610 --> 00:15:00,379
was in the in the PVR and we got that

00:14:58,639 --> 00:15:03,350
new radiator on the system we can leave

00:15:00,379 --> 00:15:06,529
it there long term even if we don't

00:15:03,350 --> 00:15:08,990
isolate the leak that old system has got

00:15:06,529 --> 00:15:10,519
quite a bit of additional ammonia in it

00:15:08,990 --> 00:15:12,830
and of course when the systems are tied

00:15:10,519 --> 00:15:14,569
together they'll they'll I will

00:15:12,830 --> 00:15:17,090
essentially get a free recharge out of

00:15:14,570 --> 00:15:19,550
the system which can also buy us quite a

00:15:17,090 --> 00:15:22,610
bit more run time while we evaluate the
next steps if we continue to monitor a slow slow leak there so that's sort of the big picture of the current state of the power system and and our overall goals for the EV a and of course Allison Bolinger has been doing just a outstanding job with her team putting together a really really well put together a VA and we've gotten a tremendous help from the engineering community as well and and and just just everyone's been outstanding so I'll give it off to Allison you can tell us all about it alright thanks Mike so as Mike
and Mike have both mentioned our ETA is

next Thursday November first with an

egress time of approximately seven

fifteen am the two crew members

performing the e VAR once again ISS

commander Suni Williams and Aki Hoshide

a so we can go to the first graphic

there we go so Sonny Williams comes to

us as our lead space Walker and she's

also currently the top female

spacewalker she has just over 44 hours

of EV a time that she has earned over

six edas and as Mike mentioned two of

those EV a's were actually spent out on
the p6 truss so she's very familiar with
this work site she will be wearing the
suit with the red stripes and this will
be her seventh EV a EV two will be aa
Kyoshi day he's the top jaksa
spacewalker right now he has a total of
14 hours and 45 minutes of EV a time
that he earned in tui bas just a little
while ago that he performed with with
sunny at the end of August in the
beginning of September he'll be wearing
the suit with the white stripes and this
will be his third EBA the newly arrived
flight engineer Kevin Ford will be our
IV assistant he will help the crew with

00:16:56,539 --> 00:17:01,039
their prep activities which includes the

00:16:58,720 --> 00:17:02,720
insuit light exercise or aisle

00:17:01,039 --> 00:17:04,339
pre-breathe protocol that the two crew

00:17:02,720 --> 00:17:06,079
members will be using for this space

00:17:04,339 --> 00:17:08,299
walk this is the same pre-breathe

00:17:06,079 --> 00:17:10,159
protocol that they used on both EPA's 18

00:17:08,299 --> 00:17:12,740
and 19 so they are very familiar with it

00:17:10,160 --> 00:17:14,509
once the pre breathe is complete Kevin

00:17:12,740 --> 00:17:16,039
will assist in getting the crew members

00:17:14,509 --> 00:17:18,349
into the equipment lock he'll shut up

00:17:16,039 --> 00:17:19,759
the hatch and then assist in the depress

00:17:18,349 --> 00:17:21,259
of that crew lock and then once the

00:17:19,759 --> 00:17:23,480
depress is complete and the crew is

00:17:21,259 --> 00:17:25,819
ready to head outside Kevin will hand
the control over to Mike Fincke as as
other mike mentioned hand over to Mike
Fincke who will be the ground ivy and
then he will take the crew through their
their planned timeline activities and
then once the EBA is complete Mike will
hand back over to Kevin inside the
vehicle and Kevin will help get the crew
inside the airlock repress the airlock
and then assist in any ammonia
decontamination procedure should the
crew get contaminated during this
procedure so we can go ahead and talk
through the
review tasks of this EBA so you could as

you know big picture as everyone

mentioned the idea here is to isolate

the to be loop that's currently flowing

through the photovoltaic radiator or PVR

so we go about doing that by driving the

fq DC or the fluid quick disconnect

coupling so we'll d mate that and then

while that's going on we'll also be

taking some pictures of the currently

deployed radiator as well as the

integrated equipment assembly adjacent

to it to see if we can see any other

signs of a possible mmod strike that
could be that could account for this

leak we will then perform the early

ammonia servicer EAS jumper

reconfiguration and then the two crew

members will work together to deploy

that radiator which is the trailing

thermal control or ticker radiators

you'll home you hear me describe it in

just a little bit there's a shroud

currently covering that so will stow the

shroud and the two crew will work

together to deploy that radiator will

also have the crew remain up the

worksite to assist in a manual EV a
deploy of that radiator if the if the

ground commands are unsuccessful so we
can go ahead and start the first video

okay so that crew members will egress

the ISS joint airlock aki will remain at

the airlock while Sonny will start

making her way port on the ISS trust she

will make a pit stop at the midpoint of

p1 where she will establish the two crew

members safety tether anchor hooks the

crew will be using safety tether packs

which consists of two 85-foot tethers

gang together one sakis tether is secure

he'll translate aft to the z1 star build

tool box to retrieve a 12 inch socket
extension that will need for TV A's

activities once sunny has established or

anchor point she'll continue to head out

board along face 12 p-3 and then she'll

make her way aft or in Zenith around the

Sarge and then she'll translate along

the zenith aft edge of p4 out to p5 and

to midpoint of p6 and she'll take the

valley between the ticker and the

sticker which is the starboard radiator

when she's out at the worksite she'll

make her way to the ISS forward face of

p6 and there she will set up camp and

she will start work initially on the EAS
471
00:19:55,549 --> 00:19:59,720
jumper reconfig she'll continue working

472
00:19:57,769 --> 00:20:01,609
on that until aki has retrieved the

473
00:19:59,720 --> 00:20:02,700
socket and followed the same translation

474
00:20:01,609 --> 00:20:04,769
path out

475
00:20:02,700 --> 00:20:06,930
sunny one Saki is out there he'll

476
00:20:04,769 --> 00:20:08,400
install the socket on the PGT or the

477
00:20:06,930 --> 00:20:09,990
pistol grip tool and the two crew

478
00:20:08,400 --> 00:20:12,030
members will work together to release

479
00:20:09,990 --> 00:20:14,309
the four fasteners that are currently

480
00:20:12,029 --> 00:20:16,500
holding the shroud that's flashing the

481
00:20:14,309 --> 00:20:18,149
cover in place that's currently

482
00:20:16,500 --> 00:20:20,700
protecting the fluid quick disconnect

483
00:20:18,150 --> 00:20:23,790
coupling once the cover is out of the

484
00:20:20,700 --> 00:20:28,230
way that Sonny will get in place to

485
00:20:23,789 --> 00:20:30,119
drive that that fq DC bolt and that's

486
00:20:28,230 --> 00:20:33,120
about seven turns and so here we can see

487
00:20:30,119 --> 00:20:34,829
a flight photo of the fq DC itself so as

488
00:20:33,119 --> 00:20:36,299
as mike's have mentioned there are

489
00:20:34,829 --> 00:20:38,490
actually two loops that are currently

490
00:20:36,299 --> 00:20:40,230
running through this radiator the to be

491
00:20:38,490 --> 00:20:42,150
side is on the left and the for B side

492
00:20:40,230 --> 00:20:43,440
is on the right so Sonny knows drive the

493
00:20:42,150 --> 00:20:46,410
one on the left don't touch the one on

494
00:20:43,440 --> 00:20:48,509
the right so she's going to use a PG t

495
00:20:46,410 --> 00:20:50,550
with a 12 inch socket extension to drive

496
00:20:48,509 --> 00:20:52,950
that and we do have some NBL footage of

497
00:20:50,549 --> 00:20:54,809
that task being accomplished so once she

498
00:20:52,950 --> 00:20:57,059
gets in position aki will hand her the

499
00:20:54,809 --> 00:20:58,589
PGT and she'll get to work as i

00:20:57,059 --> 00:21:00,419
mentioned it's a 12 inch socket on this

00:20:58,589 --> 00:21:02,579
bolt and we're only driving this bolt

00:21:00,420 --> 00:21:04,320
seven turns and what that action is

00:21:02,579 --> 00:21:07,169
doing is it's physically separating the

00:21:04,319 --> 00:21:09,629
active and passive halves of this fq DC

00:21:07,170 --> 00:21:12,269
and it's closing the valves for both the

00:21:09,630 --> 00:21:14,480
supply and return ammonia flow path to

00:21:12,269 --> 00:21:16,769
this the to be side of this radiator

00:21:14,480 --> 00:21:19,470
this is the first time we have actuated

00:21:16,769 --> 00:21:20,759
one of these fq dcs on orbit once

00:21:19,470 --> 00:21:22,710
they're complete with the seven turns

00:21:20,759 --> 00:21:25,109
they will work together to reinstall the

00:21:22,710 --> 00:21:26,340
shroud and cover and those four

00:21:25,109 --> 00:21:28,169
fasteners that are holding it in place
and then Sonny will get to work completing the rest of the EAS jumper reconfiguration so you've seen this graphic before so the left side left side shows what the current configuration is the red f ho2 hose is the one that we actually used on the Ulf 6 refill approximately a year and a half ago it had ammonia in it and we've since vented it and it's wire tied off on one end to the fh 01 hose that fh 01 hose currently has a nitrogen pad and the last time it has been touched was actually by Sonny Williams and Mike
Lopez alegria during those expedition 14

EV a's when they installed this jumper

in its current location so we have some

additional NBL footage showing this task

so you can see part of the reconfig Saul

ready complete so Sonny's reconfig the

jumpers in the lower part of the screen

while she was waiting for aki to arrive

with a 12 inch socket

then her next task is to d mate the fh

01 jumper from the m9 male so she can

vent that nitrogen pad from the jumper

once she gets the jumper d mated she'll

work on mating it to the nitrogen vent
tool once the vent tool is mated she

543
opens the female quick disconnect on

544
that jumper and then she'll vent that

545
nitrogen and that vent should only take

546
just a few seconds once she's complete

547
with the vent she'll d mate the nitrogen

548
tool from that jumper stow it away and

549
then install that fh 01 jumper on the

550
m10 male and then she'll work to a to

551
reconfigure the fh 02 jumper on to the

552
m9 male so then we'll end up with the

553
post DBA configuration shown on the

554
right where the fh the red fh 02 jumper

555
is what's applying your chilled ammonia

556
from the new radiator or the old newly

deployed radiator into the to be pvt CS

system and then the blue jumper fh 01 is

supplying your ammonia that's been

warmed by the batteries and the other

equipment out on the iea back to your

radiator for cooling so once she's

complete with the EAS jumper reconfig

she'll go over to help aki so meanwhile

aki has been taking the photos i

mentioned of the radiator as well as the

iea and he's also been working on

stowing a shroud that's currently

covering the ticker radiator this shroud

is a thin beta cloth material it's
permanently attached on the inboard or

left side of this image and then it's

it's attached by two hooks on the

outboard side it was installed by

sliding along to guide straps that run

the top and the bottom of the radiator

so achey will work to release one of the

integrated hooks and he'll slide it as

far in board as he can heal secure that

and then he'll translate to the other

side of the radiator the top side of the

radio in this image and he'll work to

shimmy that down as far as you can until

he reaches and reaches us some
interference then he'll make he'll just continue going back and forth around the radiator until he gets the shroud all the way in board and once he gets it in board he will secure it with wire ties to held it in place and it it's around this time that Sonny should be complete with their EAS jumper work so she'll make her way to the half side of p62 help aki with that shroud stow and then the two crew members will work together to release the six inches which you can see flashing this image that are currently holding the radio rate
internet stowed config they'll first

release the inboard and outboard cinches

and stow those in their stowage clips

and then they'll release the four side

cinches and stow those once they're

complete with the cinch release they'll

release the two final winch pit pins

which are holding the radiator and it's

stowed position once they release

release those winch pit pins aki will

make his way in board and Sonny will

make her way to the outboard edge of the

radiator she'll verify that all tools

tethers and EV crew members are clear of

make her way to the outboard edge of the

radiator she'll verify that all tools

tethers and EV crew members are clear of
the radiator deployment envelope and

then she'll give the ground the go to

issue the command to deploy the radiator

she'll hang tight as the radiators

deploying grabber camera and take a few
pictures of that deployment and like as

I mentioned the manual Drive bolt is

located right there near her work site

so in the event that the ground deploy

isn't successful she can help out with

her pistol grip tool to manually deploy

that radiator as she's cleaning up her

work site and taking a few more

photographs aki is translating back to

the airlock and long the same
translation path that he took out board

once he's at the airlock he'll establish

a waste Heather as the new safety as the

new safety tether for the pair Sonny

will start making her way in board

she'll make a stop at the midpoint of p1

where she had anchored their safety

tethers she'll pick those tethers up

make her way back to the airlock as well

and then they'll close the hatch on a

successful six and a half hour EBA and

the last image I'd like to leave you

with is what i'm calling sony's deja vu

as Mike mentioned this was this sunny no
stove this radiator during expedition 14

and now she's going to be redeploying it

so hopefully she will enjoy seeing this

image once again with the exception of

the Russian segment behind p6 but with

that that's all I have it hand it back

to Josh okay let's take some questions

here in Houston first and we'll go to

the phone lines just right with Gina I

don't know who wants a take this but

this is sort of like a detective trip

going out there first to see if you can

figure out they can figure out where the

leak is coming from and then you'll

leak is coming from and then you'll
proceed from there

that's correct what we'll do is because

we don't know exactly where the leak is

this this supports us an opportunity to

regain the loop while we check to see if

we've if we've taken care of the leak or

not and so what this will tell us is

whether the radiator is the cause of the

leak if it turns out the leak continues

well we we have a little time because

the the loop will continue to operate

but as Mike said when we filled this

system a year ago the result of that

phil was also fill up their early

ammonia system as well and so we have

671
00:27:01,480 --> 00:27:06,279
extra mony in that loop so it buys us a

672
00:27:03,788 --> 00:27:08,470
little time it helps us isolate it the

673
00:27:06,279 --> 00:27:10,690
PBR lets us isolate the PVR to see if

674
00:27:08,470 --> 00:27:12,909
that's the cause if that turns out not

675
00:27:10,690 --> 00:27:14,788
to be the cause and we have to think

676
00:27:12,909 --> 00:27:18,010
about the next steps and and there were

677
00:27:14,788 --> 00:27:20,200
11 point we contemplating going outside

678
00:27:18,009 --> 00:27:22,150
you can isolate all of those you could

679
00:27:20,200 --> 00:27:23,350
isolate the pump the PBR and the lines

680
00:27:22,150 --> 00:27:25,240
you have to keep the system shut down

681
00:27:23,349 --> 00:27:28,599
but again it takes you several weeks to

682
00:27:25,240 --> 00:27:30,579
figure out where what's leaking and if

683
00:27:28,599 --> 00:27:32,230
it's leaking so the next step after this

684
00:27:30,579 --> 00:27:33,279
if we're still leaking like I said butts
and we've bought ourselves some time

we'll go think about what we want to do

next whether we want to try to isolate

the other two systems and just have the

system shut down for a while whether we

are the pump and see if that fixes a

problem so we we have some forward work

to do after this as Mike said and and

many of us believe if you look at

pictures of the ISS you'll find you'll

find mmod hits on on two or three of

them in two or three locations so it's

t entirely possible that the leak sources
of is a hit to this particular PVR so

this gives us at least that it'll tell

us if that's the cause or not and then

we can decide later if it's not that

what we do next Michael meteorite hit I

mean so those are so small you really

can't do much to anticipate those what

do you do to defend yourself against

that's that tiny ahead or and how tiny a

hit would it have to be to cause a leak

this leaks really small like the actual

point it where you're leaking is

probably around the width of your hair

perhaps even smaller than that so it's a
very very tiny leak we may not even see

it if it's a direct hit and

that's as small as the hole as you

won't see it if it's a glancing blow and

we're at the deepest point you managed

to know cut into the line then maybe

you'll see it because you have the

glancing blow and the design of ISS was

was built to withstand these kinds of

hits and in these systems it was the

redundancy of the systems that gave us

that capability and so if it turns out

to be an mo he mm OD hit this is exactly

the way the design was was meant to deal
with it and we could live without

00:29:17,288 --> 00:29:22,480
this power system for the time it would

00:29:19,960 --> 00:29:25,750
take us go outside and change out a pump

00:29:22,480 --> 00:29:27,579
or or or radiator or whatever so that

00:29:25,750 --> 00:29:30,220
that's at you know the rest of the the

00:29:27,579 --> 00:29:32,980
pressurized modules have shielding

00:29:30,220 --> 00:29:35,679
around them for the smaller mmod and and

00:29:32,980 --> 00:29:38,710
then for the larger course we we protect

00:29:35,679 --> 00:29:40,840
ourselves with the help of the the strat

00:29:38,710 --> 00:29:46,360
comm folks who let us know when we have

00:29:40,839 --> 00:29:49,119
a potential conjunction our problems

00:29:46,359 --> 00:29:52,839
collect space again for who wants to

00:29:49,119 --> 00:29:54,908
take it if you by chance do see the mm

00:29:52,839 --> 00:29:56,740
OD strike if Sonny gets out there and

00:29:54,909 --> 00:29:58,240
the sun's at the right angle and you
happen to see it does that change.

anything with the spacewalk in terms of activities that you would do and is if it is an MMO d hit would you consider bringing the radiator back on a future SpaceX Dragon to study or and do you have an extra radiator out there to replace it let's see a we have an extra radiator so when we're using that we have to spare pbr's there the one the one we're deploying to use and the other one that Alison referred to as the sticker so those are our spare PDR radiators we
have one spare central system radiator

also that sits on one of the external pallets outside if we saw what we thought was the whole it wouldn't stop

what we do in because we're going into a configuration that we can operate from indefinitely and so we'd go wow that's interesting and and gee whiz and we would assume that this is going to solve our leak problem we would config continue with the configuration and as I said we could stay like this indefinitely so we would that's probably what we do and then we'd have the
00:30:56,888 --> 00:31:00,638
conversation about do we want to go to

771
00:30:59,169 --> 00:31:02,649
all the trouble to move a radiator

772
00:31:00,638 --> 00:31:04,178
because that's not a simple process and

773
00:31:02,648 --> 00:31:09,699
I don't have a capability return

774
00:31:04,179 --> 00:31:11,798
radiator today so all right thanks Omar

775
00:31:09,700 --> 00:31:14,399
crow for aviation week I had a couple of

776
00:31:11,798 --> 00:31:17,739
questions does anybody know the

777
00:31:14,398 --> 00:31:24,189
dimension of the radiator you'll be

778
00:31:17,739 --> 00:31:26,139
deploying I don't know what exactly we

779
00:31:24,190 --> 00:31:28,869
can get you that number how long does it

780
00:31:26,138 --> 00:31:31,238
take a deploy without unity with the PG

781
00:31:28,868 --> 00:31:33,459
team I'm ever took sits about one second

782
00:31:31,239 --> 00:31:35,079
of foot at the PGT so I'd be just

783
00:31:33,460 --> 00:31:37,659
guessing i would say it's probably 30 or

784
00:31:35,079 --> 00:31:40,538
40 feet I think it's 45 feet long about

785
00:31:40,538 --> 00:31:47,888
17 feet or 15 feet wide i'm not sure

786
00:31:45,970 --> 00:31:51,368
what the other dimension is i just want

to follow up on the on the spare

788
00:31:47,888 --> 00:31:56,878
question and make sure i understood

789
00:31:51,368 --> 00:32:00,308
sorry you do have a an unemployed spare

790
00:31:56,878 --> 00:32:03,428
radiator is at the case that was taken

791
00:32:00,308 --> 00:32:04,960
up during the last series of shuttle

792
00:32:03,429 --> 00:32:07,389
mission is to give you these fares

793
00:32:04,960 --> 00:32:10,749
that's the simplest radiator they're

794
00:32:07,388 --> 00:32:12,638
much bigger than these PDRs so they're

different radiators so we have one of

796
00:32:10,749 --> 00:32:15,608
those that's the one you're thinking

797
00:32:13,720 --> 00:32:17,409
that we flew it up on the second to the

798
00:32:15,608 --> 00:32:19,058
last flight i think and a pallid anyway
one of the last flights that took the pallets up we think was the last black
in fact we took the pallet I've had it on there and then for the PVR system the spares the intended spares were the two early ammonia system radiators that one of which we're going to pull if you if you place this and you still see the lead trend do you do you have some time for are you kind of back in a contingency fee be a mode where you have to go out and do something before the end of december early january i guess i'm just trying to sort of figure
out where you go if after you replace us

it sounds like it may take a few weeks

to determine whether you have a leak or

not and then if you do you're sort of

bumping up against the dead lie u spoke

up the Senators oh that's just my

question right and as we talking about

so there's more ammonia now that's been

brought to bear so we can go a little

longer at the leak rate it's not

completely clear to us the actual leak

rate so it may be a little bit slower so

we've probably bought ourselves just

because we have the extra monia we
probably bought ourselves a few months to work anything about it there you go
trending and of course there's a lot of assumptions that go into that but but using the number that had them lasting until december or january i think they told me october and again lots of assumptions go into that number but it is better and i think that's the message here let's go to the phone lines will come back here let's say we have bill hard way with CBS News yeah a couple of real quick ones from me I think it is answered that my first question is which
is how long you could last and Mike I

00:34:12,010 --> 00:34:15,129
guess you're saying if nothing changed

00:34:14,019 --> 00:34:18,568
and it all stayed the same you've got

00:34:15,128 --> 00:34:20,679
till next fall to figure something out

00:34:18,568 --> 00:34:22,509
which yet by the way you'll have this

00:34:20,679 --> 00:34:24,608
bet there's a lot of mikes involved with

00:34:22,510 --> 00:34:27,399
this e VA so maybe you should call me

00:34:24,608 --> 00:34:30,098
Mike and we'll we'll defer to mr. suffer

00:34:27,398 --> 00:34:34,539
dini here but obviously I'm sorry about

00:34:30,099 --> 00:34:36,039
that sorry about that but if we if I

00:34:34,539 --> 00:34:41,289
think your question was if we did

00:34:36,039 --> 00:34:42,789
nothing how long could we last a 1 once

00:34:41,289 --> 00:34:45,519
we've reconfigured how long we could

00:34:42,789 --> 00:34:48,219
last it's it's longer it depends on the

00:34:45,519 --> 00:34:51,849
assumptions that you use and we think
it's until October okay thanks and

another quick one for me how does an MMO
d hit explain the change in the leak

rates as you had a small leak right at

first and there was a change of some

sort we had not implied to leaks that's

what that way of life right so we had

the existing leak that we've been

feeding don't know exactly where it is

might be a QD connection don't know but

anyway we've been feeding it most of us

don't believe that that leak has gotten

worse so that was in the fault tree

though is the possibility that whatever
was causing that leak has now grown

for reasons that we couldn't exactly

explain and so that is certainly one of

the possible causes and but most of us

kind of leaning towards the mm OD impact

just because it's more likely scenario

okay and finally for me following up on

marker OHS question the early ammonia

coolant system two radiators you

mentioned that are out on p6 can they be

moved if a PVR on some other you know

module got damaged down the road yes

thank you okay Jim Oberg with NBC yeah

hydras for mr. suffered any hope I've
got all the technical question of the

is it my person that this last launches

last week was the first from the first

DUS loss from the new pad or the old pad

rather and if it was what it looked like

I with different ones is been watching

it from the gig Erin pad well Jim I tell

you I wasn't at this particular launch I

divide that responsibility with my boss

who was nice enough to go this time so I

wasn't there to witness it it was the

first human launch from that pad is my

understanding at least for many many
years if it hasn't been forever and my

00:36:43,608 --> 00:36:46,940
understanding and talking to my

00:36:45,440 --> 00:36:48,909
colleagues is that you're much further

00:36:46,940 --> 00:36:53,088
away than you are when you're at pad 1

00:36:48,909 --> 00:36:56,259
so it was a different view it's also a

00:36:53,088 --> 00:36:59,838
much longer trip to get out to the pad

00:36:56,259 --> 00:37:01,278
but you'd have to ask next time you get

00:36:59,838 --> 00:37:02,929
Gerst in front of the camera you might

00:37:01,278 --> 00:37:06,409
ask him what he thought of the of the

00:37:02,929 --> 00:37:08,440
view no problem yeah there was a couple

00:37:06,409 --> 00:37:10,399
about 40 years old early seventies or

00:37:10,400 --> 00:37:14,479
there were a couple of ladies man

00:37:08,440 --> 00:37:12,048
launches but at your right so about 40

00:37:10,400 --> 00:37:14,479
years okay well take that real good and

00:37:12,048 --> 00:37:20,808
maybe we'll both go to watch the next
one I'd be glad to do that with you Okay

let's go to Michael hollow space com oh

yeah hi guys thanks for for doing this

this is just just sort of a basic

question could you put in tough just

like a little perspective I mean is this

a mortar challenging spacewalk than the

average spaceman others there's no such

thing as an average one but you just

just kind of tell us I mean is this one

get going to be put down a really

challenging really technically difficult

in like some ways that you haven't

experienced before I mean just like
little perspective on what's what to expect with this one I'll let Allison handle some of the technical stuff but it's it's different some of these recent spacewalks we've been doing of course her outside of the shuttle era and it's been different just from a big-picture perspective in that you know this crew didn't know that they were doing that particular spacewalk one when they launched it in fact didn't know until about three weeks ago so it's it's interesting from from the point of view of getting
the sunny in hockey ready on orbit and

getting a briefing packages and talking

through things and getting them trained

when they're we don't have the

opportunity that we had with the shuttle

crews where we'd uh we'd all go out to

the NBL we'd work through the procedures

and then you know sit around on the

table and talk about how things went we

have to we have to take a little bit

different approach when it comes to just

just getting ready overall and getting

these guys that are ready to go out the

doors so that's it from the big picture

00:38:44,059 --> 00:38:47,599
different approach when it comes to just

00:38:48,920 --> 00:38:52,970
doors so that's it from the big picture

00:38:50,809 --> 00:38:54,559
perspective and maybe Allison's got a few things on that on the technical end

I would say this is an average skill level e VA maybe slightly more challenging than your average GPA the thing that we have going for us is that Sonny is very experienced with fluid quick disconnects that would be the one task in my mind that's more complicated is we do have quite a bit of fluid quick-disconnect manipulation during this e VA but since Sonny has seen these exact jumpers and cuties during increment 14 and she also experienced quite a bit of QT action at during heard
z1 work during these same EPA's I feel like she has a leg up on the competition because she's done all this stuff before the other thing that's a little more challenging is as I mentioned this is the first time that we've operated one of those fluid quick disconnect couplings or the fq DC so that mechanism does look sort of intimidating but we've got an agreement that we only need to turn it just just enough turns to close the valves so that that shouldn't be shouldn't be that bad and the rest of the tasks the radiator deploy we've done
those quite a few times over the years

so we have a good experience base to

pull from so I feel like that task

shouldn't be too challenging either

thank you ok thanks Mike let's see do we

have an Edward with j IJ press yeah

don't really have a question this time

no everything's been answered so thank

you thank you very much let's come back

here to Houston see if there's any

follow us mark brady we had a dragon

question

if that's okay it's best you know now

are you still looking at December for
the next flight and will the the first

aid propulsion issue especially now now

have any any bearing on the scheduling

or do you have some flexibility and

flying that flight if it is in terms of

delivering needed supplies or bringing

things back let's see that flight you're

talking about space X to the SpaceX to

flight is currently in January they were

supposed to move the first stage it's

kind of all coming together but I

thought it was early last week we have

agreed together that leave the stage in

macgregor for a little while while the

1012
00:41:03,460 --> 00:41:09,280
team tries to get to root cause of the anomaly and my understanding is we probably have about another week or so before we start pushing the launch date so that's kind of rough i'm trying to remember in my head those exact dates and they're not coming to me so we have a little bit of flexibility beast before we start affecting the launch date the launch date itself in january is not really critical to the program from a supply standpoint so we have some flexibility my understanding however is that pushing that flight pushes SpaceX the next SpaceX flight to ISS basics a 3
because they're going to the new version

of the Falcon 9 launch vehicle they have

to modify the pad and do some things to

get ready and they have some other

flights before ours on the new Falcon so

so any movement of that vehicle to the

right although not an impact to us from

a logistics standpoint for that white

does impact the next flight to ISS at

least today that's on paper it looks

that way I'm sure there's some things

they can do to make make up a little bit

of that so there is a possibility that

this that resolving this anomaly will
move the Falcon the SpaceX to flight

a little bit and it can move from our

depth perspectives from a logistics

perspective we're in really good shape

on orbit so we could move

quite a bit to the right and not really

be impacted by it so we've got plenty of

time to sort out the root cause the

team is doing an excellent job we've got

a lot of folks involved with our with

our SpaceX friends to try to get to root

cause they're reporting back to Us

Weekly as we as we try to sort through

it and as soon as we have something we
can hang our hat on we'll go look at the stage we got it McGregor and see if it is susceptible to that that failure mode and then we'll know more about the impact of the next flight some default but more on on the dragon the current dragon mission I think it sort of noted that that the payload was light that's my term I'm not accusing anyone of saying that but we'll do you anticipate I mean it was that sort of part of the plan that you could be that flexible or would you anticipate that that the missions would carry more payload up in
the future or I just I guess I'm not

00:43:37,019 --> 00:43:41,940
quite sure how you yeah be glad dress

00:43:39,000 --> 00:43:44,818
that we have bought a certain amount of

00:43:41,940 --> 00:43:49,079
up mass 20 metric tons over 12 flights

00:43:44,818 --> 00:43:52,409
and we will get 20 metric tons over 12

00:43:49,079 --> 00:43:54,599
flights we loaded up the International

00:43:52,409 --> 00:43:56,759
Space Station with the last few shuttle

00:43:54,599 --> 00:44:00,690
launches in order to have flexibility

00:43:56,760 --> 00:44:03,150
and launch and logistics needs so as

00:44:00,690 --> 00:44:07,440
these flights move to the right we would

00:44:03,150 --> 00:44:09,750
be able to accommodate it are so we work

00:44:07,440 --> 00:44:14,088
with our all of our our partners and

00:44:09,750 --> 00:44:17,130
SpaceX is one of them and our SpaceX

00:44:14,088 --> 00:44:20,909
folks were able to carry a more capacity

00:44:17,130 --> 00:44:22,800
on on that vehicle had we needed it but
we didn't have a need for more up mass

so they came and said if you don't need

the app mass we have another customer

that we'd like to carry up which we

agree to that was the orb com folk's

flying orb comments you also flew some

ballast so so when you talk about the

mass of the orb com and the total

capability of the sort of the SpaceX

vehicle you can't

say wow what happened to the missing up

massive there was a ballasting issue

associated with that that they also took

care of but they flew up the up mass
that we needed them to that is all that

counts towards the up mass that we

procured and in compensation for that

they put some more capability on future

spacecraft because we were flexible with

them and and what they gave us income in

return while still maintaining the total

up mass that their do over the 12

flights was the capability bring home

even more can powered stowage coming

down which is a critical need for us to

keep our life sciences logistics flow

return up and down taken care of so it

was a very big compensation for for the
agency in that respect and it also was a
big help for SpaceX because they were
able to take care of their other
customer so it's mutually agreed to we
still have all the same ms we had
planned to we didn't need this up mass
and we got extra capability out of the
vehicle so it was a an agreed to change
are just one quick call upon the on the
radiator just remembering deploying of
long packed solar arrays is there any
sticky issues and is there any concern
if there are sticking issues do you have
tools set up to try to free that before
I'll do with you well you know the one

00:46:16.079 --> 00:46:20.219
ting is it's not it's not a solar array

00:46:17.969 --> 00:46:22.849
so the mechanism is you know we were

00:46:20.219 --> 00:46:25.319
very careful about solar arrays and and

00:46:22.849 --> 00:46:28.799
you know solar arrays are considerably

00:46:25.320 --> 00:46:31.140
more flexible on the on the the

00:46:28.800 --> 00:46:35.430
mechanism it's a scissors mechanism and

00:46:31.139 --> 00:46:38.569
it's it's it doesn't really stick we've

00:46:35.429 --> 00:46:40.949
never had issues with deployments or

00:46:38.570 --> 00:46:44.960
retractions and we've we've done them a

00:46:40.949 --> 00:46:48.509
bunch of times on on these radiators

00:46:44.960 --> 00:46:50.070
okay do you know anything is no wrap it

00:46:48.510 --> 00:46:51.490
up for us we want to remind you that our

00:46:50.070 --> 00:46:54.070
coverage on November first

00:46:51.489 --> 00:46:55.449
we'll begin at six fifteen a.m. central
time there's going to be 7 a.m. eastern time the spacewalk itself as you heard will begin about an hour later at 7:15 a.m. central time 8:15 a.m. eastern time and of course we'll have live coverage of the entire thing another programming reminder coming up this Sunday we will have live coverage of the farewell and departure of the Dragon spacecraft from the International Space Station our coverage will begin at six a.m. central time the actual release will take place almost two and a half hours later at 8:26 a.m. central we will
wrap up our coverage soon after Dragon actually departs the vicinity of the orbiting complex but the deorbit burn for Dragon will take place at 128 p.m. Central with a splashdown about 250 miles off the coast of California around 220 p.m. central time we will not have that live on NASA television but you can follow the latest in terms of the deorbit burn and it's confirmation of the splash down on both SpaceX's website and a NASA website which you can access at www.nasa.gov/station we want to thank you for joining us we'll see you
back here sunday for coverage of Dragon