good afternoon thank you for joining us here at nasa's kennedy space center in florida for this commercial partnership announcement between NASA and ATK it's my pleasure to introduce our speakers today we'll hear a few comments and then take questions here at Kennedy and if we have anyone on the phone line our speakers today are ed mango NASA's Commercial Crew program manager Kent Rominger vice president of strategy and business development for ATK aerospace systems and John Schumacher atrium EADS North America mr. mango Thank you Thank
You Kendra so you like to welcome everybody here today and it's a great day to talk about commercial crew today.

Overall the Commercial Crew program is going very well we're making progress in many different areas of how we're proceeding with the program as you know Cece def to which kicked off a number of months ago and we're making very steady progress with that we're on time and on budget across the board on our milestones that we have projected today.

We want to announce that we are starting a new unfunded SI with with 80k an essay.
is an approach in which we both share data and we both share ideas to move forward with the particular design or a particular concept we believe that this effort that we start today and we'll go through next spring and will allow ATK and the Commercial Crew team our team of managers engineers and safety folks to explore the Liberty design that ATK is wanting to talk about we will have a series of milestones over the next six or nine months in which we want to talk about their design I'm going to talk about their requirements how they plan
to implement their requirements against

to talk about the capabilities of the liberty system as a whole and understand how they plan to work it in the international approach! personally think this international approach is a outstanding opportunity to understand what is best about individual companies and put those together to make the best capability for the world we also want to explore if this capability can be used in a commercial crew type of purpose which for us is to trying to get crew the International Space Station and low
Earth orbit by the middle of the decade

I look forward to expanding the knowledge base both for NASA as well as for ATK and their partners NASA will bring the expertise that we have on board with the Commercial Crew program will bring that expertise to bear to help ATK and give them our expertise and at the same time we we want to discuss what ATK and e ad s want to want to think about in this Liberty system and work with them we look forward to this cooperation i also like now to introduce Kent there's going to talk a little bit
more about the liberty system so thank you and first of all we're delighted to be here very much looking forward to this opportunity to work with NASA the experts in human space flight in the world what I want to start off with is I'd like to show a video it's all about 50 seconds so it will pictorially show us what Liberty is so if we will please roll that video so here is a picture of Liberty the first stage and it is an evolved rocket motor from the Space Shuttle boosters that were used the second stage comes as part of the area
on five system the core but we're looking at a vehicle flying right now because both pieces of this system have extensive flight experience with very impressive records as a matter of fact just last week we had a test firing on development motor 3 that 5 segment that's the first stage and now we're looking at the upper stage engine which has 45 consecutive successful flights and as part of a system that is the most successful commercial launcher on the on the planet so but lastly here we see the launch infrastructure right here at the
Kennedy Space Center this is where we intend on launching Liberty from you.

We know the real bottom line is we want to be Florida's launch system provider with our Liberty vehicle a couple more points when you say hey well well what is Liberty you know why would I want Liberty and the reason why you want it is we believe Liberty offers safest most reliable means of putting our crew on orbit when I say our crew on orbit we have the capability with 44,000 pounds of lift into Leo to launch any of the Commercial Crew provider vehicles that are out there to date what's really
fascinating with this is how well the 
upper stage matches up with our first 
stage you would think they would have 
been designed to go with each other but 
in fact they weren't but they made up 
probably as well if not better than if 
we intentionally try to design it that 
way the other thing that I’d like to 
emphasize is in 2010 President Obama 
signed in a new space policy and part of 
that space policy one of the changes 
from the previous one was the fact that 
it said we want to expand our 
international cooperation in space
flight so we are taking what we believe is a very good relationship from the space station with ESO with the European space agency and NASA and that legacy we just saw involving it into the commercial world so if you look at our Liberty system NASA developed the first stage in the five segments booster the upper stage was developed by ISA the European space agency to commercial companies now are taken that and applying it commercially so we feel very fortunate to have what we believe is a very rigorous design unlike any other
out there that was designed to lift humans from the start and we're applying commercial processes and practices to it to offer it at the best possible value for our nation's space program the other thing is it's there's a reason I'm sitting here at the Kennedy Space Center we ATK asked to come in to Kennedy Space Center because this is going to be the home of Liberty clearly the infrastructure the kennedy space center right here is set up perfectly to enable us to process liberty launched Liberty so not just use the infrastructure but
the people and the people here at the

Kennedy Space Center so we wind up

bringing jobs into Florida and using the

existing expertise that we've developed

over the last five decades and to my

knowledge

you know we are if not the only one one

of the launchers looking at really

taking advantage of this great

capability that is is here today what I

would like to do at this point now is

just tell you that the ATK team is

greatly enhanced by earning

international partner and to represent

them sitting next to me is John
shoemaker so John it's all yours thanks

Ken just a couple of remarks I wanted I
can't tell you how excited we are to be
here today and on behalf of Astrium Andy
80s North America at first like to thank
edmee go and the NASA team for their
leadership in this Commercial Crew
development program and then to our
partners ATK we think it's an honor to
be on this team with 80k they had the
innovative look almost a year ago to
come to a stream and talk to them about
could we put the the best of us and
european launch vehicle capability
together and add tremendously was as

Kent just said we think is the most competitive most capable very safe very reliable vehicle for commercial crew transport and to do that right here at the Kennedy Space Center so if I don't jump out of my chair I can tell you we are very excited for us the partnership builds on over a decade of experience that Astrium and you've probably seen it here at the cape and johnson astron north america has worked on space shuttle and Space Station and in several different aspects of space
station so we see this as a national progression and in part of the growing cooperation between the US and Europe in space capabilities as Kent spoke to it uses the Ariane 5 core stage as an upper stage with the heart the Vulcan 2 engine which is phone 45 times successfully a tremendously successful and capable flight proven system we also think we bring the experience of operating the Ariane system the commercial aspects of that the commercial aspects of going to that larger market place in a marketplace and
in some

00:08:50,879 --> 00:08:57,840
the ideas about modularity innovation

00:08:53,610 --> 00:09:00,480
and to bring that competitive force into

00:08:57,840 --> 00:09:03,149
the the whole discussion and we an ATK

00:09:00,480 --> 00:09:04,740
have had a really good time talking that

00:09:03,149 --> 00:09:08,250
through and how does liberty best

00:09:04,740 --> 00:09:09,539
advance that so just in some I would

00:09:08,250 --> 00:09:11,370
tell you we think this brings together

00:09:09,539 --> 00:09:14,669
the best of us and european launch

00:09:11,370 --> 00:09:16,139
vehicle capabilities into a the most

00:09:14,669 --> 00:09:18,240
competitive vehicle and then this

00:09:16,139 --> 00:09:19,230
commercial trade space so again thanks

00:09:18,240 --> 00:09:21,629
very much for the opportunity the

00:09:19,230 --> 00:09:23,850
privelege to be here today thank you

00:09:21,629 --> 00:09:25,679
we'll take questions from the room we do
00:09:23,850 --> 00:09:27,269
have reporters on the phone line we'll

00:09:25,679 --> 00:09:28,620
start here at Kennedy and then we'll

00:09:27,269 --> 00:09:30,929
take as many questions as we can from

00:09:28,620 --> 00:09:32,399
the phones let's start over here once

00:09:30,929 --> 00:09:33,959
the microphone comes your way please

00:09:32,399 --> 00:09:35,579
state your name affiliation and to whom

00:09:33,960 --> 00:09:40,050
you're addressing your question start

00:09:35,580 --> 00:09:42,300
with Jay Jay barbri with NBC I have a

00:09:40,049 --> 00:09:44,009
four-part or should I ask it in one part

00:09:42,299 --> 00:09:46,919
or you want me to throw all the fours

00:09:44,009 --> 00:09:51,120
out there yeah let's say let's start one

00:09:46,919 --> 00:09:52,740
at a time okay 1st Kent will you be able

00:09:51,120 --> 00:09:56,820
with this agreement to use the

00:09:52,740 --> 00:10:00,090
facilities the vab and crawler and
launch pad as you did with areas one do

you have that type of agreement so yeah

we've got a couple agreements in work

actually multiple Jay kind of an

overarching agreement and then

individual Space Act agreements that

we've been working with the various NASA

centers and people to in fact utilize as

much infrastructure as it makes sense so

the vertical Assembly Building our

operations our concept of operations

absolutely does we have the upper stage

being shipped in just like today on the

area on 5 it's shipped out of Europe
down to the equator for launch it'll be

shipped in here the first stage will

coming on rail like it did for the space

shuttle they'll go to the vertical

Assembly Building where they get stacked

assembled and the spacecraft will come

in as well and then out of the vab

you'll roll out on a launch pad out to

the launch facility so yes I guess is

the answer that that is the plan

obviously you estimate that it will

create for can see here yeah you know

our best guess initially is around 300

jobs that will bring in 300 years to
utilize that'll create here in Florida

00:11:09,009 --> 00:11:14,559
and you know you've said in the past at

00:11:11,740 --> 00:11:20,019
Liberty is already human rated as is the

00:11:14,559 --> 00:11:22,569
Aryan 5a stage is it more that you have

00:11:20,019 --> 00:11:24,220
to do unlike other people who are going

00:11:22,570 --> 00:11:26,379
to be launching here none of them are

00:11:24,220 --> 00:11:31,389
certified is there more that you have to

00:11:26,379 --> 00:11:33,490
do to certify liberty to carry a crew so

00:11:31,389 --> 00:11:35,139
ang ating you know that one's very near

00:11:33,490 --> 00:11:37,360
and dear to my heart ensuring that we

00:11:35,139 --> 00:11:39,250
have a very reliable and safe vehicle

00:11:37,360 --> 00:11:42,820
and if you look at the human rating

00:11:39,250 --> 00:11:45,789
standards they are pretty honors in in

00:11:42,820 --> 00:11:50,230
fact you have to start from conception

00:11:45,789 --> 00:11:51,909
to have a system that meets those in the
first stage absolutely does because it was designed with those in mind the second stage as well out of a stream that arion five was designed to lift her me so space plane and make no mistake NASA's human rating requirements have been out there and so people around the globe look at those requirements and they don't necessarily have to design to those requirements but they are taking into account so the Erion five our core stage our upper stage was in fact designed initially to carry humans it has not been flying that way today so
but we use the word scarred the system

is scarred with various paths

redundancies structure meets those human rating requirements or is very close to them so I believe we have a unique capability when it comes to human rating

but even larger than that the system itself the real beauty of it is it's extremely simple and if we if we look at the rocket it's got one engine for first stage one inch in for second stage and you're on orbit so the philosophy is if you minimize the things that can go wrong that can cause you to have a bad
day or not get to orbit you know if we

look at recent failures Soyuz progress

that was the third stage that resulted

in the the progress not getting into

orbit on Liberty that's not

problem because we don't need a third

stage we it's the design is so simple

that in fact we get into orbit with

dependent just on two engines for my

final four parter for ED heading back in

1956 von Braun rolled redstone number 29

out to the launch pad he had a satellite

on board and it was going to launch it

he was stopped by the Department of
Defense he was told to take 29 back to

00:13:47,649 --> 00:13:53,078
the hangar he took it back he later

00:13:50,438 --> 00:13:55,059
launched our first satellite but for him

00:13:53,078 --> 00:13:57,370
to be given an opportunity to launch

00:13:55,059 --> 00:13:59,979
that first satellite he had to go

00:13:57,370 --> 00:14:02,438
through watching Vanguard fail and two

00:13:59,980 --> 00:14:05,230
or three other steps fell after the

00:14:02,438 --> 00:14:07,149
simple rocket put up our first satellite

00:14:05,230 --> 00:14:09,579
following a simple rocket that put up

00:14:07,149 --> 00:14:11,769
the shuttles I mean put up the Soviets

00:14:09,578 --> 00:14:14,289
for a satellite now the question here is

00:14:11,769 --> 00:14:16,028
this suppose at Liberty works here it's

00:14:14,289 --> 00:14:18,219
already been out here the facilities are

00:14:16,028 --> 00:14:20,919
out here suppose it's ready to take

00:14:18,220 --> 00:14:22,750
crews back to the space station if we
got the problems that we have with the Soyuz three rocket is NASA going to push for them to go ahead and do it or are they going to have to sit back and wait for you these other rockets to get ready man rated and go will they be any influence from the agency to fly the first cruise possible to the International Space Station see a good question i would say that for this effort we're doing under this essay we're going to look at the capabilities of this Liberty system and yes both components have flown before and they
both have good histories in the past I think we have to look at the integration of those pieces how that mission profile will look for essential and technical standpoint what Commercial Crew program wants to do is we don't want to be in business of integrating a spacecraft with launch vehicles so we're very interested in helping ATK and their partners in exploring what capability they do have and then we encourage them to go work with spacecraft providers create those
partnerships and then come forward and say now they have a solution and whatever whenever that solution can meet our requirements and they can deliver crew on orbit safely then then that is the one that will go use as soon as we can Irene thanks Irene Klotz with the Reuters improbably 44 Kent the can you talk a little bit about the scope of this space act agreement in other words is 300 people that you said would be hired is that envisioned you're like now once since your agreement is signed or is that were you talking more in the
future and also if if there's any

changes between this contract that you

signed and what you had proposed to NASA

under the CC devs is kind of like your

CC dev to proposal re reborn and a new a

new arrangement yeah so I'll start with

your second question first and yes the

the Space Act agreement was lined out

and started initially as CCDF to SAA the

one difference is is the funding level

and so the milestones that we have in

their appropriate with with where we are

today and where we're moving the fact is

we'd been a little further along with a

funded agree with them with an unfunded
but the milestones the cooperation back

and forth with NASA I envision will be

very very similar to what it would have

been on a cc dev two awards so we're

very excited to be working with these

folks and the jobs yes the jobs will

come on incrementally as we work through

the program well with the majority of

them probably about a year from flight

is processes and vehicle processing

starts coming into Florida and that'll

be full up you know within a couple of

months of that first launch for the

processing so are you saying that with
this base act agreement you're actually planning on a launch and if so when do you anticipate that would occur so this space act agreement is through March you know so it's a relatively short period in the philosophy was I believe in propellant ed talked but i think the philosophy was just like ccdf to it will end and then the next set of agreements will be put in place IDC the to integrated design contract so we are absolutely leveraging this to advance as far as we can and then competing on IDC and as far as a launch date you know
that will be determined by funding

profiles and progress that is made but

what I can tell you is as I look at

systems out there particularly

spacecraft systems and our launcher I

believe that we are ahead of all the

systems so we can be ready when the

space vehicles are ready to fly then i

guess i will add that you know the whole

concept of CCF to was to mature

capabilities and move progress move

forward on progress towards Commercial

Crew systems and so this unfunded

agreement now we have with 80k as part


of that CCDF to profile if you look at

00:18:44,759 --> 00:18:49,500
it as a overall portfolio of what we

00:18:46,650 --> 00:18:51,930
want to go do as it being unfunded you

00:18:49,500 --> 00:18:54,150
know from the taxpayer standpoint really

00:18:51,930 --> 00:18:56,100
the techs payer is helping to make sure

00:18:54,150 --> 00:18:58,980
that NASA team can support the

00:18:56,099 --> 00:19:01,349
discussions and an eight DK is using

00:18:58,980 --> 00:19:04,140
their internal capabilities in order to

00:19:01,349 --> 00:19:06,000
go fund their half of the agreement from

00:19:04,140 --> 00:19:07,620
at this particular point it's a great

00:19:06,000 --> 00:19:09,869
way to do business and explore the

00:19:07,619 --> 00:19:12,809
capabilities that ATK has with other

00:19:09,869 --> 00:19:15,059
British system this this whole idea of

00:19:12,809 --> 00:19:17,159
CCF too will come to an end towards next

00:19:15,059 --> 00:19:19,859
spring and summer of next year and then
we'll move into the next phase what this helps by starting today with 80k is it helps them move their system and moves

their system progress forward so that then they can work to compete in the next round if they wish to do so bill bill where we see if he has a two quick ones for me I wanna make sure I understand this Kent what you're saying is that you're going to study this you and NASA are both going to look at this system for the next six to nine months or however long that lasts and then there's another decision point coming
and if you guys don't get money from NASA at that point is that the end of this or would you keep going beyond there on your own yeah so bill what I was really trying to say is we are working as we have been with the Liberty maturing the Liberty system towards ultimately a launch NASA and now the Space Act agreement enables us to work much more closely with NASA and vice versa to along that goal and it really isn't you know digital that either a we do continue or don't continue with an IDC award for example our goal is to
continue working liberty and again it's
paced by funding amongst other things

but for us the space act agreement is
very exciting because it enables NASA to
gain more insight into Liberty which i
think is a great thing and it also
enables us to leverage all this
expertise that's here one more from me

what about how does liability work in
the sense when you have loaded fuel
segments in a government building like
the vab just just in general liability

for a commercial operation whereas in
the past that's always been I guess

self-insured by the government if there

was a mishap or something and be if

everything really did go well and this

really did march down the road when

would when were the earliest be that we

could see actual flight hardware out

there on the pad getting ready to go on

a test flight for example so if you want

to take that foot in the lie doing how

to answer okay that is a very good

question we are working the solutions

for commercial entities coming into

government facilities that happens

that's not something that's new to

commercial crew that happens quite a lot
happens even today at this center but it also happens in other centers and other government facilities where commercial entities come into those nice when they enter into agreements or contracts or whatever the right mechanism is the rules for liability are then laid out and for Commercial Crew those rules are also being laid out and as we move into the next phase you'll see how those rules will be set up so that the liability for NASA on our government facilities has taken care of either by NASA or by the partner the
commercial partner and that might be in
	here but it is unique to each

particular Center in each particular

facility depends what else is going on

in the facility it depends when NASA

might need the facility for other

activities so all that plays into the

mix so there isn't a clear-cut answer

except to say that liability of

government facilities is very important

obviously to the NASA and so we have we

want to be rolling out what those rules

are over as we move into the next phase

if I could just add to that in my fact
the last several weeks there have been

meetings to that very issue bill and

what I've seen is based on history and

what we've learned over the years NASA

is re-evaluating in leveraging a lot of

data to make a pretty informed decision

so that if it works commercially they

are enabling it so you know hats off to

everything we see going to your question

hey when can we fly we've we've

kind of always been on regular saying

hey we can meet an IOC in 2015 and again

when the spacecraft are ready we will be

ready 15 for IOC 2015 4 IOC
it's sorry you don't that's I get told

00:23:30,829 --> 00:23:38,119
that all the time Jason I had todd todd

00:23:35,480 --> 00:23:42,259
halvorson with florida today i have a

00:23:38,119 --> 00:23:45,859
couple if i could so far in CC dev one

00:23:42,259 --> 00:23:49,250
NC c-dub to NASA as invested primarily

00:23:45,859 --> 00:23:51,049
in the development of piloted spacecraft

00:23:49,250 --> 00:24:00,079
that would actually be on top of the

00:23:51,049 --> 00:23:55,940
launch vehicle rather than a launch

00:23:52,579 --> 00:24:00,079
vehicle I was wondering if in the next

00:23:55,940 --> 00:24:03,230
round NASA would consider actually

00:24:00,079 --> 00:24:04,939
funding the commercial development are

00:24:03,230 --> 00:24:06,769
providing seed money for a launch

00:24:04,940 --> 00:24:08,660
vehicle rather than a spacecraft and

00:24:06,769 --> 00:24:12,849
what you think about the importance of

00:24:08,660 --> 00:24:17,650
having more than one US launch vehicle
available during the Commercial Crew era

t from the program standpoint you know

we foresee caf2 we did have most of our

funding all went to spacecraft and part

of that rationale was we really thought

spacecraft was the long pole in order to

getting a complete system we have

entered into unfunded essays with

another launch vehicle provider as well

as a DK and so we are very interested in

making sure that the launch vehicle

capabilities are also there when the

spacecraft is not ready to be used so we

think that we have a portfolio that
addresses both launch vehicle as well

spacecraft in terms of the next phase I

think we've made it pretty clear from

the Commercial Crew program standpoint

that the next phase we want the

integrated system we do not we NASA do

not want to be the integrator of a

launch vehicle in spacecraft we want

industry just as you would if you're

building a new aircraft they figure out

what power plants to put on an aircraft

when engines to put on the aircraft and

also to build the aircraft itself and

the passenger could make a billet ease
all that and then they sell that to the customers in this case that's sort of the approach we're looking for we want a complete system that that industry wants to bring to us and then we'll evaluate those different capabilities and to go from there just as a problem for Kent the spacecraft developers in the commercial area all seem to be lining up to get on board the United Launch Alliance Atlas rocket I think Sierra Nevada and you know everybody but SpaceX seems to want to fly on Atlas who are you guys talking to
and can you talk a little bit about

whether or not anybody could launch on

this vehicle yeah so so Todd the real

quick answer to that is hey we're
talking to everybody that we can and you

mentioned SpaceX they're kind of

self-contained so that being the

exception with Liberty you know we

showed up a little bit later than the

Atlas 5 that's been flying haven't said

that what we found are a couple of

things folks are very interested in

Liberty because of the value that we

bring so you know Giada mentioned that

we're competitive we believe pricing
wash for the performance nobody can match what Liberty can do and particularly if you look at the reliability and safety of the systems the heritage of our systems so we're talking to all the folks and we've had real good reception from the folks out there so our goal is to lift be able to lift everybody and eventually be signed on with folks to lift all the spacecraft out there because performance wise we can do that we'll take one more question here in the room before going to the phone lines and then we'll come back to
Kennedy if there any follow-up so Jason

please Jason Ryan with America's space

I believe this question kind of follows up on what Todd was asking and

it's for ED there seems to be a diverse range of launch vehicles as well as spacecraft that are being developed at one time now after challenger in Colombia we experienced a two-year gap before we could fly astronauts again is what we're seeing here potentially be like if there's a similar accident one of the i want to say fleet of different launch vehicles that are potentially
launching astronauts if there's a bad day as it were that would probably alleviate that issue wouldn't it or is that what NASA is working towards or not to have a diverse range of launch vehicle providers provide service to the International Space Station thank you good good strategic question and we talked about that question quite a lot within the program and with an agency from the Commercial Crew program standpoint we would like multiple providers by the time we get the station the best way we know how in order to
keep a capability going would be to have multiple capabilities in which if one capability cannot support we can go to another one now that assumes that there's a adequate amount of funding in order to go do that and the fixed kurma investment that the NASA would bring to the table has to be large enough to do that at the same point you know in order to go in orbit orbit is really an international kind of affair and so we will still always have a Russian capability that I don't think we're going to say no to I think there's also some capability that is dissimilar and
when you use the Russian capability as compared to a system that is focused in the United States the goal is to have multiple capabilities in order to get to the Earth orbit and now that is our goal for the foreseeable future and see positive too and in our next phases we very much want to have as many companies as we can afford basically from a design standpoint which is that really this phase in the next phase well now go to the phone lines I will call your name if you have a question please state your affiliation and to whom you're
addressing your question or let us know

if you don't have one mark Kerr oh

thanks mark crow for aviation week can

you explain the range or number of crew

that you are sized with liberty to

launch on a single mission and also if

you might touch on whether you would

consider a second launch site like in

kourou french guiana in addition to

Kennedy or your kind of all in at

Kennedy is

or yes so mark if you look at the size

of crew the numbers I've seen from the

spacecraft or seven is the largest
number I've seen our performance is such that if somebody developed a little bit bigger spacecraft I believe we could lift them into low-earth orbit but the goin number is seven so which is a great number and it helps a business case and particularly for the spacecraft right flying the crew bigger is better for to help them close of business case as far as launch sites right now our concentration is on Florida just because of so much that it naturally offers and has readily available to us at minimum cost and in the commercial world the
minimum cost just means value back to

00:30:45,430 --> 00:30:50,560
the customer for the the dollars per

00:30:47,230 --> 00:30:52,839
ride having said that we are absolutely

00:30:50,559 --> 00:30:54,460
are looking at all the markets for

00:30:52,839 --> 00:30:55,990
liberty and that's really one of the

00:30:54,460 --> 00:30:58,180
advantage a launcher has over our

00:30:55,990 --> 00:31:00,490
spacecraft is that in addition to crew

00:30:58,180 --> 00:31:03,100
we have cargo and then we have

00:31:00,490 --> 00:31:07,029
satellites gto so we are evaluating

00:31:03,099 --> 00:31:11,889
other other missions as well as launch

00:31:07,029 --> 00:31:17,519
sites mark you have a follow-up no thank

00:31:11,890 --> 00:31:21,910
you very much alan Boyle thank you a

00:31:17,519 --> 00:31:24,910
couple of related questions one is do

00:31:21,910 --> 00:31:29,279
you and what exactly kind of work do you

00:31:24,910 --> 00:31:29,279
anticipate doing between March and
fights and are there and is there any

scenario where NASA would be paid by ATK

for services rendered so interesting

question and the answer to the last one

is yes as a matter of fact as we look at

different trajectory analysis with the

capabilities nASA has there is

absolutely a scenario where we pay NASA

for services so it's kind of interesting

how the tables can maybe flip but if you

look at the expertise around the world

you realize hey this is where it is in

for some cases the other one is

you know we're in between our systems
design review and our preliminary design

review and we're working through those milestones as we go so the additional design analysis cycles for one which is very key in getting us to the PDR that's initially what we're working on Alan did you have a follow up there there is a little bit of a follow-up I'm just trying to digest all this there's a little bit of crosswalk on the phone but no not at this time thank you okay Mike wall yes mike wall from space com l

wall yes mike wall from space com I guess I just had a brief question could you give an idea of what yeah what the
potential impact of this is going to be

on your sort of on like and I'm in the

actual progress of this rocket I mean

how much of a difference is it going to

make in the taste of your progress are

we talking about six months like I don't

know nine months development increase or

or is only way you can put any numbers

on kind of how this is is actually going

to find I have an impact on on what you

guys are doing yeah you know that's a

really good question but I don't know

how to answer that you know what I

would say is hey maybe in a month if you

would say is hey maybe in a month if you
asked me that question I have a much

better idea having evaluated kind of how

we are proceeding and moving but it

unfortunate mark i don't know i'm

struggling coming up with an answer to

that one for you mike did you have a

follow-up sure sure yes could you just

give an example of if some of the things

you can do with this partnership that if

you couldn't have done maybe just with

your own personnel so you know one

example is the Space Act agreement we're

sititing here in Florida having said that

so for the launching the engineering

there's a lot of expertise there but
also this team is compromised a lot of folks from the Marshall Space Flight Center that have worked with our segment mo a lot in have a lot of data it's at the CVR level that we will leverage as we produce as we progress towards our PDR so you know again the detailed analysis cycles that we're working towards well NASA will be involved and part of that and I'm trying to be careful you're not getting ass into trouble because there are certain regulations on how much the government can do along with a
commercial company and at the same time

the guidance I advise the evaluation is

absolutely critical so you know and I

might love that when you're away it's

all coming see good question for for

this particular essay a NASA will be

bringing to the table a number of skill

capabilities in which we will offer

those 280 k and e ad s in the evaluation

of their Liberty system those systems

would include things like structural

analysis thermal analysis vibration

analysis the hard core engineering

capabilities you need to understand how
you're going to take a capability that were two separate capabilities that is a first stage and another first stage and put them together in a unique combination and so NASA has those capabilities that we can bring to bear to help check what ATK and EADs have been talking about and they're what the homework they've been doing if they were like us to do the homework that is they would like us to do the analysis then it gets into a probably an earlier question at that point ATK then comes forward and says they would like NASA to produce
that for them and they pay NASA for that capability when it comes to evaluating their system their requirements and there are detailed design we can do that as part of the SAA and it's no cost to 280 k we do that in house because for NASA it helps us understand what Liberty system is all about and it also helps in tree specifically ATK and EAD s understand because we're bringing us expertise to bear that have worked other systems like five segments and like other liquid boosters and so we bring all that to bear and that's what we bring to the agreement during this
particular time if we did not have an agreement and ATK wanted to come forward and talk about these particular analyses or these particular products we would have to fit that into our overall plan of work that we would have for NASA folks over the next six months to a year and and we would not have an agreement by which we would give priority to this particular capability by having an essay now it says NASA is stepping up and we want to make this a priority to take our resources and use it on those specific analytical capabilities at ATK would
like us look at Joe Baumann the nightly news blog for the deseret news in Salt Lake

my question is I have a couple questions first of all will this affect the workforce and Utah a key apk has and secondly what is do we learn that we don't already know about the performance of these vehicles thank you so the first answer is Joe yes in Utah Liberty will stabilize the existing workforce and and part of what the liberty system does in fact if you look at between our first stage in our second stage there are manufacturing lines that exist today I
guess the second stage line at this point in time is busier than the first stage line but they are exist in opening so we are just leveraging work forces that exist and I just forgot your second question wondering what do you need to learn about the two different vehicles that you don't already know oh yes so what we need to learn is although both stages have a lot of flight time and experience at least that they have evolved from it has not flown as a system so integrating a system is a lot easier said than done so we need to
learn how a system interacts as we put it together

we need to make sure that the avionics system the electronics to control the stack in fact trajectory wise make it go where it’s supposed to go that we fully appreciate the load stresses and the environments that this vehicle goes through as well as we're assembling it ensure that the quality is there that in fact it is going together as designed and meets all of the requirements the safety requirements so even though they're very mature systems there is a lot to learn still Robert Pearlman hi
Robert Pearlman with collectspace.com

just to clarify the Space Act agreement

address or enable the use of space

shuttle flowing solid rocket motor

hardware cases of the segments for

liberty as a commercial launch vehicle

or if not as those components already

belong to a DK are there SRM related

hardware that belongs to NASA is that

this agreement affords a PK to use of so

great question this space act agreement

actually is an agreement with the

Commercial Crew folks and it's

independent of a similar agreement that
in fact we do need and plan on using to

leverage the rsr arm hardware through a different agreement one of those a Space Act agreement to in fact utilize that

our SRM hardware but again it is not this specific space act agreement Robert

do you have a follow-up okay thank you

Dan Leone yeah I this will be a question for ed I guess you mentioned somebody mentioned earlier that all of these wonderful things we're talking about today are contingent on the funding picture just for clarity should I

interpret that to mean that you all are
planning this out including the upcoming integrated design that's going to be the next commercial crew thing you all anticipating doing you're planning based on the 2012 request of 850 million if we come in below that should we expect to see some of this ambition cut back this is ed let's see yeah our planning is based on the president's proposal that he gives to Congress every year and so we look at that proposal and we and we build a program around that that is not to say that we look at all kinds of information and try to figure
out how and how we would react to

various capabilities if the numbers are

less or more I will tell you in order to

get a capability to the Earth orbit by

the middle of the decade and in order to

have that with competition we need a

robust budget capability in order to

make Commercial Crew work and and work

safely if we don't have enough funds

then you're going to either stretch out

the schedule or you're going to make it

less safe and I can tell you myself and

the program is not against making us

safe at all so we will make it as safe

as it needs to that means we may not get
there by the middle of the decade and if

you don't get there by the middle of the
decade normal program that takes longer

than it's expected will end up costing

more money because you're keeping

the workforce that you have in place

around longer in order to finish the

work that you have to get done and so

our plan is pretty solid and it does

match with what has been requested from

the executive branch of the government

and so that's what we build our plans to

and by having a robust capability we

will be able to get something in orbit
that is a focused on a u.s. system by

the middle of the decade next on the

line is Amy Donahue

okay Kenneth Chang hi thank you had two

questions for add mango one is how many

NASA people will be working on this and

the second question is does this play

into a larger strategy or a NASA human

spaceflight meaning that it seems like

it'd be a really smart thing to do if

you're looking to reduce the cost of

boosters for the Space Launch System or

maybe even a gateway for getting

international cooperation well with this
00:43:12,170 --> 00:43:18,590
decision just simply in the context of

999
00:43:14,179 --> 00:43:21,949
Commercial Crew see the first question

1000
00:43:18,590 --> 00:43:24,920
how big is the NASA team the detailed

1001
00:43:21,949 --> 00:43:27,319
NASA team is approximately a dozen to

1002
00:43:24,920 --> 00:43:29,570
two dozen folks and that will be pretty

1003
00:43:27,320 --> 00:43:31,610
much full time on this effort they will

1004
00:43:29,570 --> 00:43:33,950
then be able to reach back and we call

1005
00:43:31,610 --> 00:43:35,870
that our part of our insight team our

1006
00:43:33,949 --> 00:43:39,409
insight team will probably be a new

1007
00:43:35,869 --> 00:43:42,019
order of 50 individuals but not all will

1008
00:43:39,409 --> 00:43:43,730
be full time as we work through the next

1009
00:43:42,019 --> 00:43:47,590
nine months and do this in valuation

1010
00:43:43,730 --> 00:43:50,389
with 80 k and e ad s in terms of our

1011
00:43:47,590 --> 00:43:53,720
purpose our purpose is for commercial

1012
00:43:50,389 --> 00:43:56,869
crew which is to create a capability for

00:43:53,719 --> 00:43:58,399
low Earth orbit the rules that we are

00:43:56,869 --> 00:43:59,900
trying to follow and the rules that we

00:43:58,400 --> 00:44:03,559
would like to engage on as we want an

00:43:59,900 --> 00:44:06,590
American leadership system and by having

00:44:03,559 --> 00:44:08,389
an 80 k and e ad s system we believe

00:44:06,590 --> 00:44:10,269
that that matches the requirements that

00:44:08,389 --> 00:44:13,250
that we would like an American

00:44:10,269 --> 00:44:15,710
leadership system in order to go into

00:44:13,250 --> 00:44:19,809
low-earth orbit at the same point I

00:44:15,710 --> 00:44:23,480
can't tell you how I think it's great

00:44:19,809 --> 00:44:25,190
from a national capability for the

00:44:23,480 --> 00:44:26,630
United States to reach out to its

00:44:25,190 --> 00:44:29,539
international partners because when

00:44:26,630 --> 00:44:31,700
you're on orbit you know there's no
lines between the countries it's a planet and so let's use the best capabilities we have in the planet in order to put together our system and I think that's what ATK and AES is trying to propose to us so I welcome that kind of partnership. Kenneth do you have a follow-up question for Mrs. Schumacher? Has a stream started work on air starting to volcano there is a series of activities that were gone since almost a year now I guess Kent with looking at as Ken said adapting that the both of the vulcain.
the if I could area in five core stage

as a second stage air start and some

other aspects of that as well as

integration with the five segments solid

so that discussion and some preliminary

work has gone on and has gone in

conjunction with discussions with 80k

we'll take our last questions on the

phone from mark Matthews if you have any

okay well hug mark did you have

questions okay we'll come back here to

your Kennedy to take some follow-up Todd

I believe you had the first follow-up

todd halvorson of florida today and i
actually have to would this launch vehicle be capable of launching the Orion spacecraft as envisioned now and for ed I was wondering if you could kind of walk us through what the next step is after CC Deb to how much money you anticipate having for a third round of investment and what that whole stage would look like so yeah I'll take the first question you right now we left over 44,000 pounds so no Ryan lite version to go to the space station the tot is yes we have the performance for that if you want to launch the beyond
Leo version with a couple of you know

1070 00:46:43,340 --> 00:46:47,870
call it tweaks but one of our challenges

1071 00:46:45,170 --> 00:46:49,250
on Liberty has been because we're

1072 00:46:47,869 --> 00:46:51,589
commercial and we're trying to get to

1073 00:46:49,250 --> 00:46:54,710
market is inexpensively and as quickly

1074 00:46:51,590 --> 00:46:56,390
as possible we are passing up a number

1075 00:46:54,710 --> 00:46:58,970
of performance enhancements that we

1076 00:46:56,389 --> 00:47:01,129
right now we just don't need but there

1077 00:46:58,969 --> 00:47:03,379
are you know from the expansion ratio on

1078 00:47:01,130 --> 00:47:05,030
the the nozzle to pull in some inert

1079 00:47:03,380 --> 00:47:07,250
weight out of the upper stage because we

1080 00:47:05,030 --> 00:47:09,970
initially made it beefy just to make it

1081 00:47:07,250 --> 00:47:14,079
much quicker and easier to get to market

1082 00:47:09,969 --> 00:47:17,509
the long answer is yes we can lift

1083 00:47:14,079 --> 00:47:19,730
beyond leo Orion as well with a few
performance enhancements that are all sophisticated it's the in terms of

the overall plan I think we we did address that a couple months ago so I'll try to summarize it here and we in the near term will be having more discussion with industry and with the public about what our future plans are for the hybrid kind of approach in which CC dev one and two were really focused on moving forward the capabilities of partners of contractors or of industry moving those capabilities forward as
quickly as possible and then we won't help them do that NASA would help with our funded SaaS and our unfunded essays help with our expertise that's these two phases the next phase is really want to get into integrated design capabilities we need to match spacecraft with the launch vehicle with a ground system or a launch system as well as with the on-orbit capability to work on low Earth orbit our set of requirements that are on the table today are out publicly and folks can look at them are really related towards our primary mission from
a NASA standpoint which is to get a crew for crew the International Space Station by the middle of the decade and so that's the next phase is an integrated design phase the following phase is our certification phase now we have an integrated design both NASA and our partners have agreed to that design we sign up the debt design we sign up the how we're going to go do certification with the net design and then that that fourth day is really is that certification process that phase will last quite some time because
certification against the human rating

00:49:05,360 --> 00:49:09,559
certification requirements we have on

00:49:07,099 --> 00:49:12,049
the table today is quite extensive we

00:49:09,559 --> 00:49:14,299
have to make sure the system is safe and

00:49:12,050 --> 00:49:15,890
can perform and once it does that then

00:49:14,300 --> 00:49:19,220
we'll enter the next phase which

00:49:15,889 --> 00:49:21,288
our services phase for ISS that services

00:49:19,219 --> 00:49:23,598
phase is we hope to be by the middle of

00:49:21,289 --> 00:49:25,970
the decade and will basically include at

00:49:23,599 --> 00:49:28,338
least two flights a year on rotations

00:49:25,969 --> 00:49:30,348
about every six months you know the

00:49:28,338 --> 00:49:32,028
Commercial Crew program has two focuses

00:49:30,349 --> 00:49:34,609
the first is our capability get the

00:49:32,028 --> 00:49:36,230
international space station with an

00:49:34,608 --> 00:49:40,639
american-made system or american-led
system the second is to encourage the
capability of commercial systems for
other purposes in low-earth orbit and so
we our goal and within the program is to
facilitate both with the priority being
we need to figure out how to get the ISS
with a american-led system as soon as we
can Irene for Kent what's the size of
the ATK and EAD s a workforce on Liberty
oh gosh if you look at the folks that we
have working on Liberty and pulling on
the combined size is probably around 35
folks 35 to 40 do you have is there a
business case without commercial crew
without NASA the there there is a business case it's not as strong and so Liberty actually it's a very good leo vehicle for this kind of performance so if you look at NASA between crew and cargo Liberty fits into that very well for an example by cliff into a TV as a transfer resupply vehicle Liberty fits into that quarter category as well having said that there absolutely is a very strong pull for the satellite world particularly US government satellite world as well that we believe offers a more robust business case Jason Jason
Ryan for America’s based on org and I

see me playing second fiddle to Todd

today because my question kind of comes

off of his again I noted one an

illustration that ATK Liberty was shown

launching cst-100 which is by Boeing

dreamchaser which is by sierra nevada

you got your Ryan light which is by

Lockheed Martin and I guess my question

is more of a technical one is is ATK

developing like a universal mating

adapter or maybe a pair of adapters that

could attach a different space crafts at

the top of liberty thank you yeah the
quick answer is yes who absolutely with

1184
00:51:46,369 --> 00:51:52,630
a universal space adapter and I think if

1185
00:51:49,699 --> 00:51:54,919
you look in a guest space X aside but

1186
00:51:52,630 --> 00:51:56,420
everybody and dream chaser is a little

1187
00:51:54,920 --> 00:51:59,119
bit unique as well being the winged

1188
00:51:56,420 --> 00:52:01,430
vehicle but for capsules I think the

1189
00:51:59,119 --> 00:52:02,929
goal amongst all of us competing and

1190
00:52:01,429 --> 00:52:05,599
commercial cruise in fact to have a

1191
00:52:02,929 --> 00:52:08,509
common interface because it's through a

1192
00:52:05,599 --> 00:52:11,929
common interface that we can be very

1193
00:52:08,510 --> 00:52:15,230
efficient with who who fits on top

1194
00:52:11,929 --> 00:52:18,379
without exorbitant amount of costs to

1195
00:52:15,230 --> 00:52:20,659
have each one is a unique design so the

1196
00:52:18,380 --> 00:52:23,510
answer is yes so common interfaces the

1197
00:52:20,659 --> 00:52:26,960
design concept will take one last
1198
00:52:23,510 --> 00:52:31,010
question from Jay excuse me Jay barberry

1199
00:52:26,960 --> 00:52:33,170
with NBC can't you mention hardware here

1200
00:52:31,010 --> 00:52:36,470
in the next few months its Hardware on

1201
00:52:33,170 --> 00:52:39,409
its way what will you be doing for this

1202
00:52:36,469 --> 00:52:42,669
first phase here testing and carrying on

1203
00:52:39,409 --> 00:52:46,279
and can you envision any scenario where

1204
00:52:42,670 --> 00:52:47,930
some European contract might be

1205
00:52:46,280 --> 00:52:50,390
interested I know they have area on

1206
00:52:47,929 --> 00:52:52,460
doing a great job but is there any way

1207
00:52:50,389 --> 00:52:56,000
that possibly Europe might come into

1208
00:52:52,460 --> 00:53:00,590
this ISA fly some manned spacecraft from

1209
00:52:56,000 --> 00:53:04,510
here so you know I'm looking at shoes

1210
00:53:00,590 --> 00:53:07,430
for help on that one yeah Clinton I

1211
00:53:04,510 --> 00:53:10,190
we're really focused on right now Jay is
is this torsional career development

with NASA US market that type of thing

and bringing that capability here and as

Ken talked to earlier use the tremendous

human spaceflight capability that's here

as Kennedy and go next gen on that so

that's really the focus now let's go

the next few months yeah so in the next:

few months it's right now it's paper it

is paper so as we're working towards you

know once we get to critical design

review then we start on the hardware

haven't seen that we do have an

electronics lab avionics lab and that
does involve hardware and so we do have hardware and systems running there but there are in our laboratories our development laboratories back in Utah in kind of other places around the nation including EAD's as far as Florida's concerned no you know not for for certainly not within the next year would there be hard we're headed in here and also the one other thing I'd touch on too because again the focus is Commercial Crew development that's very but as Ken talked about earlier as you talk about some of the cargo
applications for example etv

1241
00:54:21,840 --> 00:54:26,730
possibilities and things like that again

1242
00:54:24,900 --> 00:54:29,309
there's lots of possibilities as we get

1243
00:54:26,730 --> 00:54:31,199
rolling in this this work the unfunded

1244
00:54:29,309 --> 00:54:35,730
Space Act looks us get further along

1245
00:54:31,199 --> 00:54:38,699
looking at all those options that will

1246
00:54:35,730 --> 00:54:40,349
conclude today's NASA ATK commercial

1247
00:54:38,699 --> 00:54:41,819
partnership announcement for more

1248
00:54:40,349 --> 00:54:48,960
information on NASA's Commercial Crew

1249
00:54:41,820 --> 00:54:51,470
program visit www.nasa.gov/twan thank

1250
00:54:48,960 --> 00:54:51,470
you for joining us

1251
00:54:53,340 --> 00:54:56,490
thank you