

## Mark Rivers

---

**From:** Mark Rivers  
**Sent:** Tuesday, December 15, 2015 4:03 PM  
**To:** Kurt Leinenweber

Hi Kurt,

At today's meeting of the COMPRES Facilities Committee a couple of questions came up which we hope you can answer.

- One member was told that ASU was now charging overhead on the standard cell assemblies, resulting in an ~50% price increase. Can you clarify this?
- Can you please break down the \$40K supplies budget Approximately how much for carbide, sintered diamond anvils, ceramic formulas, etc.

Thanks,  
Mark

## Mark Rivers

---

**From:** Kurt Leinenweber <KURTL@asu.edu>  
**Sent:** Tuesday, December 15, 2015 4:30 PM  
**To:** Mark Rivers  
**Subject:** RE:  
**Attachments:** Assembly and carbide prices 14 12 05.docx

Hi Mark,

Thank you for the e-mail. I hope AGU is going well.

On the question of overhead, please see the attached Price List that includes a statement at the beginning about the ASU overhead. The overhead has been on the assembly prices since the beginning of the project. It was originally 25% and then bumped up to 35%, but when ASU Research Technical Services took over the funding of the standardized cell assemblies in 2009 they instructed me to use 54%. It covers the part of my salary and the salary of helpers, plus any unexpected costs such as bad parts, extra inventory, breakage. The statement about the 54% overhead has been on the price list since 2009.

I have tried to be very forthcoming about the existence of the overhead and try to make sure the users know about it. I also tell all the users the sources of all the parts so they can go around the system and save the overhead if they want, and several people have done that on at least some of their purchases. Many people are now using the vendors that we discovered during the course of this project.

The new and experimental parts that I obtain through COMPRES funding are not sold. They are provided to COMPRES members for free, for testing and development purposes.

Does that make some sense?

I'll get that itemized list for the Supplies budget to you next.

Thank you,

- Kurt

-----Original Message-----

From: Mark Rivers [<mailto:rivers@cars.uchicago.edu>]  
Sent: Tuesday, December 15, 2015 3:03 PM  
To: Kurt Leinenweber <[KURTL@asu.edu](mailto:KURTL@asu.edu)>  
Subject:

Hi Kurt,

At today's meeting of the COMPRES Facilities Committee a couple of questions came up which we hope you can answer.

- One member was told that ASU was now charging overhead on the standard cell assemblies, resulting in an ~50% price increase. Can you clarify this?

- Can you please break down the \$40K supplies budget Approximately how much for carbide, sintered diamond anvils, ceramic formulas, etc.

Thanks,

## Mark Rivers

---

**From:** Kurt Leinenweber <KURTL@asu.edu>  
**Sent:** Tuesday, December 15, 2015 4:56 PM  
**To:** Mark Rivers  
**Subject:** RE: COMPRES MAP project  
**Attachments:** Itemized Materials and Supplies.docx

Hi Mark,

Here is the itemization I had in mind when I requested this budget for Materials and Supplies. Is this enough detail?

Should I send these two e-mails to the others on the list (the rest of the Committee) or do you want to send them?

Thanks,

- Kurt

-----Original Message-----

From: Mark Rivers [<mailto:rivers@cars.uchicago.edu>]  
Sent: Tuesday, December 15, 2015 3:48 PM  
To: Kurt Leinenweber <[KURTL@asu.edu](mailto:KURTL@asu.edu)>  
Cc: Andrew Campbell <[campbell@geosci.uchicago.edu](mailto:campbell@geosci.uchicago.edu)>; Bin Chen <[binchen@hawaii.edu](mailto:binchen@hawaii.edu)>; Dan Shim <[sshim5@asu.edu](mailto:sshim5@asu.edu)>; Kanani K. M. Lee <[kanani.lee@yale.edu](mailto:kanani.lee@yale.edu)>; Mark Rivers <[rivers@cars.uchicago.edu](mailto:rivers@cars.uchicago.edu)>  
Subject: COMPRES MAP project

Hi Kurt,

Thanks very much for the quick and informative reply.

Mark

---

From: Kurt Leinenweber [[KURTL@asu.edu](mailto:KURTL@asu.edu)]  
Sent: Tuesday, December 15, 2015 4:30 PM  
To: Mark Rivers  
Subject: RE:

Hi Mark,

Thank you for the e-mail. I hope AGU is going well.

On the question of overhead, please see the attached Price List that includes a statement at the beginning about the ASU overhead. The overhead has been on the assembly prices since the beginning of the project. It was originally 25% and then bumped up to 35%, but when ASU Research Technical Services took over the funding of the standardized cell assemblies in 2009 they instructed me to use 54%. It covers the part of my salary and the salary of helpers, plus any unexpected costs such as bad parts, extra inventory, breakage. The statement about the 54% overhead has been on the price list since 2009.

I have tried to be very forthcoming about the existence of the overhead and try to make sure the users know about it. I also tell all the users the sources of all the parts so they can go around the system and save the overhead if they want,

## Itemization of Materials and Supplies budget for COMPRES Multi-Anvil Cell Assembly Project

Sintered diamond anvils from Sandvik and/or Sumitomo for ultrahigh pressure development (with GSECARS). Sandvik anvils have not been previously tested.

\$10 K

New grades of tungsten carbide from Sandvik, Fujiloy, others for extending pressure capabilities of conventional multi-anvil

\$10 K

Development of 25/15 assembly, smaller assemblies for ultrahigh pressure development. New molds for injection-molded octahedra and DIA cubes.

\$14 K

Development of pressure standards: reagents, crucibles, other materials and supplies for sol-gel, high-temperature, and cold seal or gas vessel syntheses needed to create large quantities of pressure standards for distribution to the community. A commercial synthesis of SiO<sub>2</sub>-GeO<sub>2</sub> glass for pressure calibrations. Some high pressure syntheses for adding high-pressure phases for reversals.

\$6 K

TOTAL            40K

## Mark Rivers

---

**From:** Mark Rivers  
**Sent:** Monday, December 21, 2015 12:52 PM  
**To:** Kurt Leinenweber  
**Cc:** Andrew Campbell; Bin Chen; Dan Shim; Kanani K. M. Lee; Mark Rivers; Abby Kavner; Jennifer Jackson; Quentin Williams; Steve Jacobsen (steven@earth.northwestern.edu); Wendy Panero (panero.1@osu.edu)  
**Subject:** RE: COMPRES MAP project

Hi Kurt,

The Facilities and Executive Committees also were interested to get some more information on the carbide and sintered diamond projects. Can you please provide a brief description of the plans for each project? Is the total cost for these the \$10 K for sintered diamond anvils and \$10K for carbide that you listed in your previous e-mail?

Thanks,

-----Original Message-----

From: Mark Rivers  
Sent: Tuesday, December 15, 2015 4:48 PM  
To: Kurt Leinenweber  
Cc: Andrew Campbell; Bin Chen; Dan Shim; Kanani K. M. Lee; Mark Rivers  
Subject: COMPRES MAP project

Hi Kurt,

Thanks very much for the quick and informative reply.

Mark

---

From: Kurt Leinenweber [KURTL@asu.edu]  
Sent: Tuesday, December 15, 2015 4:30 PM  
To: Mark Rivers  
Subject: RE:

Hi Mark,

Thank you for the e-mail. I hope AGU is going well.

On the question of overhead, please see the attached Price List that includes a statement at the beginning about the ASU overhead. The overhead has been on the assembly prices since the beginning of the project. It was originally 25% and then bumped up to 35%, but when ASU Research Technical Services took over the funding of the standardized cell assemblies in 2009 they instructed me to use 54%. It covers the part of my salary and the salary of helpers, plus any unexpected costs such as bad parts, extra inventory, breakage. The statement about the 54% overhead has been on the price list since 2009.

I have tried to be very forthcoming about the existence of the overhead and try to make sure the users know about it. I also tell all the users the sources of all the parts so they can go around the system and save the overhead if they want, and several people have done that on at least some of their purchases. Many people are now using the vendors that we discovered during the course of this project.

## Mark Rivers

---

**From:** Kurt Leinenweber <KURTL@asu.edu>  
**Sent:** Tuesday, December 22, 2015 11:53 AM  
**To:** Mark Rivers  
**Subject:** RE: COMPRES MAP project

Hi Mark,

Yes, that is the total cost, and I am requesting 10 K for carbide and 10 K for sintered diamond in total.

For the carbide project, the community has been interested for a long time in some grades of carbide that were reported in Ivan Gettings paper where he performed strength testing on blanks of several types of carbide. I would use the 10 K to obtain test batches of carbide and to test them in a multi-anvil. There is a Sandvik grade that tests very close to Toshiba Grade F and I would like to obtain a trial batch of that carbide and test it directly for strength and durability in the multi-anvil application. There are other grades of Sandvik carbide and of Fujiloy carbide that are more brittle but also harder, and should be suitable for reaching 40 GPa (10-15 GPa higher than our current limit). This will be tested by synthesizing Al-rich bridgmanite. At our multi-anvil workshop at the COMPRES meeting this year, Katsura reported making very Al-rich bridgmanite using a Fujiloy carbide grade, that quenches as lithium niobate instead of perovskite structure. I would like to do that within the COMPRES project and make that capability available to our community. Finally, I would like to evaluate a lower-cost carbide that has been reported by Gabriel Gwanmesia. Anything that works well and has any advantage over others (cost, hardness, durability) will be made available to our community.

For the sintered diamond, Yanbin is already working on sintered diamond and has some experience in the area. My contribution will be to work with Sandvik Hyperion in Ohio on specialty sintered diamond cubes for our community, and testing them at GSECARS with Yanbin. I have begun a communication with Sandvik about the grain size and anvil size that we need. The performance of this sintered diamond will be compared to that of the material from Sumitomo. I am seeking to have some help from Sandvik on getting an anvil material that would be better tailored to our application (all of the sintered diamond materials I am aware of are made for wire dies and not for anvils). Thus, I would use the 10 K to have Sandvik design and make trial anvils for testing at GSECARS.

Thank you,

- Kurt

-----Original Message-----

From: Mark Rivers [mailto:rivers@cars.uchicago.edu]  
Sent: Monday, December 21, 2015 11:52 AM  
To: Kurt Leinenweber <KURTL@asu.edu>  
Cc: Andrew Campbell <campbell@geosci.uchicago.edu>; Bin Chen <binchen@hawaii.edu>; Dan Shim <sshim5@asu.edu>; Kanani K. M. Lee <kanani.lee@yale.edu>; Mark Rivers <rivers@cars.uchicago.edu>; Abby Kavner <akavner@ucla.edu>; Jennifer Jackson <jackson@gps.caltech.edu>; Quentin Williams <qwilliam@ucsc.edu>; Steve Jacobsen (steven@earth.northwestern.edu) <steven@earth.northwestern.edu>; Wendy Panero (panero.1@osu.edu) <panero.1@osu.edu>  
Subject: RE: COMPRES MAP project

Hi Kurt,

The Facilities and Executive Committees also were interested to get some more information on the carbide and sintered diamond projects. Can you please provide a brief description of the plans for each project? Is the total cost for these the \$10 K for sintered diamond anvils and \$10K for carbide that you listed in your previous e-mail?