The Regents of the University of California

COMMITTEE ON OVERSIGHT OF THE DEPARTMENT OF ENERGY LABORATORIES
September 18, 2014

The Committee on Oversight of the Department of Energy Laboratories met on the above date at UCSF–Mission Bay Conference Center, San Francisco.

Members present: Regents Blum, De La Peña, Newsom, Pattiz, Reiss, Sherman, and Zettel; Ex officio members Napolitano and Varner; Advisory member Gilly

In attendance: Regents Engelhorn, Gould, Island, Leong Clancy, Lozano, Makarechian, Ruiz, and Saifuddin, Regents-designate Davis, Gorman, and Oved, Faculty Representative Hare, Secretary and Chief of Staff Shaw, General Counsel Robinson, Chief Compliance and Audit Officer Vacca, Chief Investment Officer Bachher, Senior Vice President Dooley, Vice Presidents Budil, Duckett, Lenz, and Sakaki, Chancellors Blumenthal, Gillman, Leland, Wilcox, and Yang, and Recording Secretary McCarthy

The meeting convened at 11:25 a.m. with Committee Chair Pattiz presiding.

1. **APPROVAL OF MINUTES OF PREVIOUS MEETING**

Upon motion duly made and seconded, the minutes of the meeting of July 17, 2014 were approved.

2. **UPDATE ON THE DEPARTMENT OF ENERGY LABORATORIES AND PRESENTATION ON USING CLIMATE CHANGE DETECTION AND ATTRIBUTION METHODS TO STUDY THE CAUSES OF DROUGHT**

[Background material was provided to Regents in advance of the meeting, and a copy is on file in the Office of the Secretary and Chief of Staff.]

Committee Chair Pattiz thanked Committee Vice Chair De La Peña for attending the recent meeting of the Los Alamos National Security LLC (LANS) Board of Governors. He invited all Regents to attend a board meeting or visit the National Laboratories. Former Los Alamos National Laboratory (LANL) and Lawrence Livermore National Laboratory (LLNL) Director Michael Anastasio was chosen in consultation with President Napolitano to replace Professor Steven Beckwith as a University of California Advisory Governor on the LANS and Lawrence Livermore National Security LLC Boards of Governors. Mr. Anastasio would be an excellent representative of the interests of University.

Regent De La Peña added that his visit to LANL reminded him of the enormous national security significance of that Laboratory and its intricate relationship with UC through its

science, involvement with UC students, and Laboratory employees who were educated at UC.

Vice President Budil stated that understanding the earth's climate and the effect of human activities on that climate is one of the most important and compelling scientific questions. She introduced world-renowned atmospheric scientist and LLNL climate researcher Benjamin Santer, a member of the LLNL Program for Climate Model Diagnosis and Intercomparison. Mr. Santer's early research on the climatic effect of combined changes in greenhouse gases and sulfate aerosols contributed to the historic discernable human influence conclusion of the Intergovernmental Panel on Climate Change's (IPCC) "Climate Change 1995" report. He contributed to all five scientific assessment reports of the IPCC and was convening lead author of the chapter on detection of climatic change and attribution of causes. Mr. Santer has received numerous awards and fellowships, including the U.S. Department of Energy's Ernest Orlando Lawrence Award and being named a Fellow of the MacArthur Foundation; Mr. Santer was elected to the National Academy of Sciences in 2011.

Mr. Santer displayed a map showing the amount of water vapor in the atmosphere on the day Hurricane Katrina made landfall in 2005, indicating scientists' transformational ability to monitor global-scale changes in earth's climate from space. This ability has enabled an understanding of the nature and causes of climate change. Mr. Santer said his presentation would involve detection of climate change, meaning the process of showing that an observed change is statistically highly unusual, and the attribution of climate change, or the more difficult process of establishing cause and effect relationships. The IPCC was established in the late 1980s by the World Meteorological Organization and the United Nations Environment Program to inform the world's governments about the nature and causes of climate change, and possible mitigation and adaptation strategies. The IPCC's most recent report "Climate Change 2013" stated that "Human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, in global mean sea level rise, and in changes in some climate extremes….It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century." Mr. Santer noted that "extremely likely" in this document meant with more than a 95 percent probability. He explained the evidence on which this conclusion was based. Complex geographical patterns and slices through the earth's atmosphere using computer simulations with complex models of the earth's climate system can now be studied to determine "fingerprints," or different factors that influence the climate. These models have shown warming at lower levels of the atmosphere and cooling at higher levels.

Mr. Santer recalled that he had spent one-and-a-half years of his scientific career defending the statement in the finding of the 1995 IPCC report that "The balance of evidence suggests a discernable human influence on global climate." He faced Congressional investigations and calls for his dismissal from the LLNL. That experience led him to the conclusion that a clear public understanding of the science of climate change was worth defending. Since that time, more complex fingerprint methods have been developed to include observations of more climate variables, combining computer

models with the most advanced satellite observations. UC scientists at many campuses and the Scripps Institution of Oceanography contributed to this work. The common conclusion running through all the research has been that natural causation alone does not explain the observed changes. Elements of direct social and economic concern to Californians were studied, including shifts in the timing of runoff from major river basins and snowpack depth. A major challenge would be to apply these results to understand whether precursors of drought, such as patterns of changes in ocean surface temperatures, were changing in such a way that would favor drought in the future. Another challenge was to estimate projected changes in rainfall.

Mr. Santer observed that it can be stated with confidence that, if fossil fuel consumption and greenhouse gas emissions continue at current rates, California will warm, changing the temperature gradient between the Equator and the Arctic, affecting large-scale atmospheric circulation and rainfall patterns. Snowpack depth would decrease and runoff from predominantly snow-fed river basins would occur earlier in the year, with huge implications for infrastructure and agriculture.

In summary, Mr. Santer said scientists now have ways of fingerprinting the climate system to try to understand the nature and causes of climate change. The effects of human activity have been found in changes in rainfall, ocean salinity, water vapor, snowpack depth, and river basin runoff. Mr. Santer commented that in his personal experience as a mountain climber around the world he has observed dramatic evidence of the retreat of glaciers. He expressed his belief in a moral and ethical imperative to try to preserve the earth's beautiful natural places for future generations.

Committee Chair Pattiz asked for Mr. Santer's views on desalination to solve both sea level rise and drought, and on developing infrastructure to move water from one part of the country to another. Mr. Santer agreed that sea levels would rise and noted scientists' increased ability to calculate the effect of melting ice sheets on sea level rise. He also agreed that managing the state's water resources would be increasingly important, including making improvements to the state's water infrastructure.

Regent Makarechian asked how scientists such as Mr. Santer could inform politicians of their findings and the long-term implications of those findings. Mr. Santer expressed his view that he had a responsibility to communicate his findings about climate change in the public arena. He said there was currently increased receptivity to information about climate change. Regent Makarechian agreed that communicating with the public about scientific results is part of UC's mission of public service.

Regent Reiss expressed pride in the work of UC researchers in this area.

Regent Newsom commented that California had been a leader in energy efficiency, building codes, and fuel standards. He expressed pride in the talent of UC researchers and their contributions to progress in understanding climate change.

3. **RESOLUTION TO EXCLUDE ACCESS TO FEDERAL CLASSIFIED INFORMATION**

The President of the University recommended that the resolution pertaining to the University's Department of Defense Facility Security Clearances be approved as shown in Attachment 1.

[Background material was provided to Regents in advance of the meeting, and a copy is on file in the Office of the Secretary and Chief of Staff.]

Committee Chair Pattiz stated that this routine action was to conform to Regents' policy on security clearance for access to federally classified information and proposed adoption of an exclusion resolution for Regent Atkins. This action was required since the University maintains its Department of Defense facilities security clearance. With the Board's approval, Regent Atkins would be excluded from all access to classified information and/or special nuclear material, and would not participate in any decisions or other matters pertaining to the protection of classified information and/or special nuclear material.

Upon motion duly made and seconded, the Committee approved the President's recommendation and voted to present it to the Board.

The meeting adjourned at 12:05 p.m.

Attest:

Secretary and Chief of Staff

ATTACHMENT 1

RESOLUTION

Pursuant to the *Policy on Security Clearance for Access to Federal Classified Information* adopted on March 29, 2012 and this Resolution, the following named member of the Board of The University of California shall not require, shall not have, and can be effectively excluded from access to all classified information and/or special nuclear material released to the Regents of the University of California until such individual is granted the required access authorization from the cognizant security agency. And, as a consequence of this Resolution, such individual does not occupy a position that would enable her to adversely affect the policies or practices of the University of California, or its subsidiary, regarding the performance of classified contracts for the United States Government.

NAME	TITLE
Toni Atkins	Ex officio Regent