

## **IV. Rehabilitation Engineering Research Centers (RERCs)**

### **A. General Information**

Rehabilitation Engineering Research Centers (RERCs) plan and conduct research leading to new scientific knowledge and innovative methods, procedures and devices to benefit people with disabilities. Funded by the Department of Education's National Institute on Disability and Rehabilitation Research (NIDRR), RERCs develop and disseminate methods of applying advanced technology and psychological/social knowledge in order to expand the options available to those with disabilities. There are approximately two dozen RERCs, each one focused on a different area of disability related research. They were created by NIDRR to be centers of excellence, bringing together top scientists, engineers, researchers and clinicians in order to develop technical innovations that will have a lasting impact on the lives of persons with disabilities.

### **B. The Rehabilitation Engineering Research Center on Telecommunication Access**

The RERC-TA is a joint project of Gallaudet University's Technology Access Program (TAP) and the Trace Research and Development Center at the University of Wisconsin-Madison. The main goal of the RERC-TA is to make communications technologies accessible to (and usable by) people with disabilities. Naturally, the RERC -TA was quick to answer the FCC's call for commentary regarding the Emergency Alert System. On October 29, 2004 The RERC-TA submitted comments to the FCC concerning the future of the EAS. The comments recommended:

1. A major upgrade of EAS, including mandatory participation by broadcast stations and an expansion of EAS rules to cover new digital technologies.
2. Expanding EAS to new devices is essential for providing emergency information to people with disabilities.
3. New technological pathways for EAS communications to include wireless data networks that reach millions of Americans in remote locations, fixed and mobile.

4. More comprehensive planning and coordination among state and federal agencies and focused on the benefits of digital and alternative technologies for people with disabilities.

For more information on the Technology Access Program, please visit  
<http://tap.gallaudet.edu/>

For more information on the Trace Center, please visit <http://trace.wisc.edu/>

On February 22<sup>nd</sup> 2006, the RERC-TA filed comments with the FCC regarding access to emergency services for telecommunication relay services and speech-to-speech services for Individuals with hearing and speech disabilities. Suggestions included:

1. A timely, holistic review of 9-1-1 with respect to accessibility to people who are deaf and hard of hearing.
2. IP text relay be reviewed for its functional adequacy for 9-1-1 calling.
3. A standardized numbering plan for relay callers be considered.
4. A reliable IP text platform be identified and supported across telecommunication network technologies to ensure interoperability.
5. The Office of Engineering and Technology be heavily involved in the review of plans and decisions regarding technical approaches.

RERC's complete 2006 report to the FCC  
(<http://tap.gallaudet.edu/FCC/RERC%20IPRQRS911Dkt03-123.doc>)

### **C. Accessible Emergency Notification and Communication Conference**

On November 2-3, 2005 RERC-TA sponsored a conference on Accessible Emergency Notification and Communication at Gallaudet University in Washington DC. The purpose of this conference was to “identify needs and gather possible solutions for accessible emergency notification and communication and to encourage interaction among industry, government, and consumer experts so that accessibility considerations are more likely to be built into notification and communication products and procedures.” This timely and insightful conference was attended by accessibility experts, government representatives involved with emergency communications, academicians, industry representatives and consultants.

This conference exemplified the RERC commitment to excellence. The program was meticulously produced to present a broad spectrum of important topics with engaging experts to expound upon them. Professionals in the field came from as far away as Japan to attend this conference. Bridge Multimedia’s representative reported that the enthusiasm of the seminar’s participants was infectious. Spirited conversations regarding Emergency Notification abounded and many important acquaintances were made. The conference fulfilled its promise of providing a forum whereby participants and attendees were able to exchange important ideas and information. Topics and presenters included:

1. Accessibility Tools and Gaps

*Cheryl Heppner*

Executive Director

Northern Virginia Resource Center for Deaf and Hard of Hearing People

*Janina Sajka*

Partner

Capital Accessibility, Inc.

2. Governmental Activities on Accessible Emergency Notification

*Daniel W. Sutherland*  
Officer for Civil Rights and Civil Liberties  
U.S. Department Homeland Security

3. Radio Broadcast Data

*Mike Starling*  
Vice President for Engineering and Operations  
National Public Radio

4. Making Televised Emergency Information Accessible

*Larry Goldberg*  
Director, Media Access Group  
WGBH

5. NOAA NWS Emergency Warning

*Kenneth Putkovich*  
Consultant  
U.S. National Oceanographic and Atmospheric Administration (NOAA)

6. Email Alerts: What's Available

*Marcia Brooks*  
Project Director, Access Alerts Projects  
WGBH

7. Common Alerting Protocol

*Art Botterell*  
Consultant  
President, Incident.com

8. Emergency Communication and Federal Employees

*Paul Singleton*

Computer/Electronic Accommodations Program

U.S. Department of Defense

9. Campus-Level Accessible Notification

*Carl Pramuk*

Dean of Student Affairs

Gallaudet University

10. Accessible Alarms During Sleep: Research Results

*Jacqueline DuBois*

Combustion Science and Engineering, Inc.

11. Direct Person-to-Person Telecommunications

*Gregg Vanderheiden*

Director, Trace R&D Center

Co-PI, Rehabilitation Engineering Research Center (RERC) on

Telecommunications Access

University of Wisconsin, Madison

12. PSAP Accessibility Under ADA

*Robert Mather*

Senior Trial Attorney

US Department of Justice

13. Related Proceedings and Rules of the FCC

*Gregory Hlibok*

Attorney Advisor

FCC, Consumer and Governmental Affairs Bureau, Disability Rights Office

14. Recovery of Service under Telecommunications Service Restoration Priority

*John Hogue*

Program Manager

Sprint

15. CapTel Service and 9-1-1 Calls

*Kevin Colwell*

Vice President of Engineering

Ultratec, Inc.

16. Video Relay Service Technology and 9-1-1 Calls

*Mike Maddix*

Product Manager

Sorenson Communications

To access the Accessible Emergency Notification and Communication Conference program,  
please visit;

<http://www.tvworldwide.com/events/nod/051102/default.cfm>

#### **D. Wireless RERC**

The RERC on Mobile Wireless Technologies for Persons with Disabilities, also known as *The Wireless RERC*, has parallel goals to promote universal access to mobile wireless technologies and to explore their innovative applications in addressing the needs of people with disabilities. The Wireless RERC is based out of the Georgia Institute of Technology. According to their website, “With an overall goal of promoting independence and autonomy of people with disabilities, the Wireless RERC has two primary aims: 1) ensure equitable access to mobile wireless products and services by people with disabilities of all ages and abilities; and 2) investigate promising applications

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8/22/06

of mobile wireless technologies in support of employment, independent living and community integration of people with disabilities.”

On March, 2006 the Wireless RERC issued a publication entitled “Increasing Access to Wireless Technologies” at the 21<sup>st</sup> annual International Technology and Persons with Disabilities Conference at California State University. It included facts on Access, Awareness, Economic, Regulatory, Technology, and Policy Options.

To Download this PowerPoint Presentation, Please Click Here

[http://www.cacp.gatech.edu/Presentations/CSUN\\_2006/Nathan/csun\\_06\\_baker\\_moon\\_final.ppt#345,1,Rehabilitation Engineering Research Center](http://www.cacp.gatech.edu/Presentations/CSUN_2006/Nathan/csun_06_baker_moon_final.ppt#345,1,Rehabilitation Engineering Research Center)

The Wireless RERC’s comments on Federal Communications Commission regulations included three filings to the FCC in areas regarding emergency communication and notification. These submissions were as follows:

1. On October 9, 2003 the Wireless RERC submitted reply comments to an FCC *Notice of Proposed Rulemaking* regarding telecommunications relay services (TRS) and the requirements set forth in the Americans with Disabilities Act of 1990. In responding to comments filed by various advocacy groups for the deaf and hard of hearing, the Wireless RERC emphasized to the FCC the importance of providing parity of service with respect to emergency communications. Additionally, the Wireless RERC recommended expanding TRS requirements so as to allow text messages to become a regular part of emergency communication systems.
2. On October 18, 2004 the Wireless RERC, in response to the FCC’s *Further Notice of Proposed Rulemaking*, suggested that the FCC encourage wireless manufacturers to build-in TTY capability so as to enable more reliable emergency communications for users with disabilities.

3. On October 29, 2004 – The Wireless RERC submitted comments to the FCC's *Notice of Proposed Rulemaking* about the future of the Emergency Alert System (EAS). The comments particularly recommended more comprehensive planning and coordination among state and federal agencies and focused on the benefits of digital and alternative technologies for people with disabilities.

For more information on the Wireless RERC, please visit:

<http://www.wirelessrerc.gatech.edu/index.html>

## **E. List of RERCs and Contacts**

### **1. RERC For The Advancement Of Cognitive Technologies**

The goal of this RERC is to research, develop, evaluate, implement, and disseminate innovative technologies and approaches that will have a positive impact on the way in which individuals with significant cognitive disabilities function within their communities and workplace.

#### **University of Colorado**

Health Sciences Center

1245 East Colfax Avenue, Suite 200

Denver, CO 80218

Principal Investigator: Cathy Bodine, PhD, CCC-SLP

Contact: Cathy Bodine, PhD, CCC-SLP

Voice: (303) 315-1281

TT: (303) 837-8964

Fax: (303) 837-1208

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## **2. RERC On Accessible Medical Instrumentation**

The goal of this RERC is to (1) increase knowledge of, access to, and utilization of healthcare instrumentation and services by individuals with disabilities and (2) increase awareness of and access to employment in the healthcare professions by individuals with disabilities.

### **Marquette University**

Department of Biomedical Engineering

P.O. Box 1881

Milwaukee, WI 53201

Co-Principal Investigator: Jack Winters, PhD

Co-Principal Investigator: Molly Follette Story, PhD

Contact: June Isaacson-Kailes

Voice: (310) 821-7080

Fax: (310) 827-0269

e-Mail: [jik@pacbell.net](mailto:jik@pacbell.net)

## **3. RERC On Accessible Public Transportation**

This RERC addresses the need for improvements in the accessibility of public transportation, particularly inter-city travel via air, rail, and bus.

### **Oregon State University**

National Center for Accessible Transportation

Civil, Construction and Environmental Engineering

Corvallis, OR 97331-2302

Principal Investigator: Kate Hunter-Zaworski, PhD, PE

Contact: Kate Hunter-Zaworski, PhD, PE

Voice: (541) 737-4982

Fax: (541) 737-3052

e-Mail: [katharine.hunter-zaworski@oregonstate.edu](mailto:katharine.hunter-zaworski@oregonstate.edu)

#### **4. RERC On Technology For Children With Orthopedic Disabilities**

The Rehabilitation Engineering Research Center on Technology for Children with Orthopedic Disabilities focuses on research and development assisting children to achieve their full potential as productive citizens.

Rancho Los Amigos National Rehabilitation Center  
Los Amigos Research and Education Institute, Inc. (LAREI)  
Rancho Rehabilitation Engineering Program  
12841 Dahlia Street, Building 306  
Downey, CA 90242  
Director: Donald McNeal, PhD; Sam Landsberger, ScD  
Phone: 562-401-7994  
Fax: 562-803-6117  
TTY: 562-803-4533

#### **5. RERC On Communication Enhancement**

The mission of this RERC is to assist people who use augmentative and alternative communication (AAC) technologies in achieving their goals across environments. The goals and objectives of the RERC are to advance and promote AAC technologies through the outputs and outcomes of research and development activities and to support individuals who use, manufacture, and recommend these technologies in ways they value.

#### **Duke University Medical Center**

Department of Surgery

Division of Speech Pathology & Audiology

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8/22/06

Durham, NC 27710

Principal Investigator: Frank DeRuyter, PhD

Contact: Kevin Caves, ME, ATP, RET

Voice: (919) 684-3540

TT: (919) 684-6626

Fax: (919) 681-9984

e-Mail: [kevin.caves@duke.edu](mailto:kevin.caves@duke.edu)

## **6. RERC On Hearing Enhancement**

The Rehabilitation Engineering Research Center on Hearing Enhancement is a national project which conducts research programs that promote technological solutions to problems confronting people who are deaf or hard of hearing.

### **Gallaudet University**

Division of Audiology and Speech-Language Pathology

800 Florida Avenue, NE

Washington, DC 20002

Co-Principal Investigator: Matthew H. Bakke, PhD

Co-Principal Investigator: Arlene Neuman, PhD

Contact: Matthew H. Bakke, PhD

Voice: (202) 651-5335

Fax: (202) 651-5324

e-Mail: [matthew.bakke@gallaudet.edu](mailto:matthew.bakke@gallaudet.edu)

## **7. RERC On Improved Technology Access For Landmine Survivors**

The Center strives to improve the quality and availability of amputee and rehabilitation services for landmine survivors by focusing on the development of mobility aids, and the

creation of educational materials, all of which are designed specifically for mine-affected populations and disseminated through a network of rehabilitation service providers in mine-affected regions.

**Center for International Rehabilitation (CIR)**

211 East Ontario, Suite 300

Chicago, IL 60611

Principal Investigator: Yeongchi Wu, MD

Contact: Yeongchi Wu, MD

Voice: 312-229-1359

Fax: (312) 229-1370

e-Mail: [info@cirnetwork.org](mailto:info@cirnetwork.org)

**8. RERC On Mobile Wireless Technologies For Persons With Disabilities**

This RERC develops appropriate and effective applications of wireless technologies that enhance the independence of people with disabilities.

**Georgia Institute of Technology**

Georgia Center for Advanced Telecommunications Technology (GCATT)

250 14th Street

Atlanta, GA 30318

Principal Investigator: Helena Mitchell, PhD

Contact: Helena Mitchell, PhD

Voice: (404) 894-0058

Fax: (404) 894-1445

e-Mail: [helena.mitchell@gcatt.gatech.edu](mailto:helena.mitchell@gcatt.gatech.edu)

## **9. RERC On Prosthetics And Orthotics**

The goal of this RERC is to improve the quality of life for persons who use prostheses and orthoses through creative applications of science and engineering to the prosthetics and orthotics (P&O) field. The goal is to uncover new knowledge and understanding in P&O and to bring more quantification to the field, which will enable them to develop new concepts and devices to improve the quality, cost-effectiveness, and delivery of P&O fittings.

### **Northwestern University**

Feinberg School of Medicine

345 East Superior Street, Room 1441

Chicago, IL 60611-4496

Principal Investigator: Steven A. Gard, PhD

Contact: Steven A. Gard, PhD

Voice: (312) 238-6525

TT: (312) 238-6530

Fax: (312) 238-6510

e-Mail: [sgard@northwestern.edu](mailto:sgard@northwestern.edu)

## **10. RERC On Recreational Technologies And Exercise Physiology Benefiting Persons With Disabilities**

This program researches access to recreational opportunities and physical endurance of people with disabilities, targeting four primary areas: (1) increased access to fitness and recreation environments; (2) interventions to increase physical activity and recreation participation; (3) adherence strategies to reduce physical activity relapse and dropout rates; and (4) randomized clinical trials to evaluate improvements in health and function.

**University of Illinois at Chicago**

Department of Disability and Human Development

1640 West Roosevelt Road, Suite 712

Chicago, IL 60608-6904

Principal Investigator: James H. Rimmer, PhD

Contact: James H. Rimmer, PhD

Voice: (312) 413-9651

Fax: (312) 355-4058

e-Mail: [jrimmer@uic.edu](mailto:jrimmer@uic.edu)

**11. RERC On Rehabilitation Robotics And Telemanipulation: Machines Assisting Recovery From Stroke**

This RERC focuses its research and development on restoring function in hemispheric stroke survivors. Another goal of this RERC is to develop robotic devices or machines that assist the therapist in providing treatments that are rationally based, intensive, and long in duration.

**Rehabilitation Institute Research Corporation**

345 East Superior Street, Room 1406

Chicago, IL 60611-4496

Principal Investigator: W. Zev Rymer, MD, PhD

Contact: W. Zev Rymer, MD, PhD

Voice: (312) 238-3919

Fax: (312) 908-2208

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## **12. RERC ON SPINAL CORD INJURY**

This RERC improves the lives of individuals with SCI by promoting their health, safety, independence, and active engagement in daily activities.

### **Los Amigos Research and Education Institute, Inc. (LAREI)**

Rancho Los Amigos National Rehabilitation Center

P.O. Box 3500

Downey, CA 90242

Co-Principal Investigator: Samuel E. Landsberger, ScD

Co-Principal Investigator: Robert Waters, MD

Contact: Linda Sutherland

Voice: (562) 401-7541

Fax: (562) 803-5569

e-Mail: [l.sutherlandrerc@verizon.net](mailto:l.sutherlandrerc@verizon.net)

## **13. RERC On Technology For Successful Aging**

The RERC-Tech-Aging conducts research, development, education, and information dissemination work on technology for successful aging. Projects of the RERC focus on the closely related areas of communications, home monitoring, and "smart" technologies.

### **University of Florida**

Department of Occupational Therapy

101 S. Newell Dr., Suite 2101

Gainesville, FL 32611

Principal Investigator: William C. Mann, PhD

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TT: (352) 273-6817

Fax: (352) 273-6042

e-Mail: [clocklea@phhp.ufl.edu](mailto:clocklea@phhp.ufl.edu)

#### **14. RERC On Technology Transfer**

The activities of this RERC transfer and commercialize new and improved assistive devices, conduct research to improve technology transfer practice, and support other stakeholders involved in the technology transfer process.

#### **University at Buffalo, The State University of New York**

Center for Assistive Technology

322 Kimball Tower

Buffalo, NY 14214-3079

Co-Principal Investigator: Stephen M. Bauer, PhD

Co-Principal Investigator: Vathsala I. Stone, PhD

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Voice: (716) 829-3141 ext. 135

TT: (800) 628-2281

Fax: (716) 829-2420

e-Mail: [jimleahy@acsu.buffalo.edu](mailto:jimleahy@acsu.buffalo.edu)

#### **15. RERC On Telecommunications Access**

This RERC identifies telecommunication access barriers in current and future technologies, work with others in the field to identify solution strategies, test them, implement any necessary standards, and assist industry in transferring the ideas into their commercial products.



### **University of Wisconsin-Madison**

Trace Research and Development Center  
1550 Engineering Drive, Room 2107 ECB  
Madison, WI 53706-1609

Co-Principal Investigator: Gregg C. Vanderheiden, PhD

Co-Principal Investigator: Judy Harkins, PhD

Contact: Kate Vanderheiden

Voice: (608) 265-4621

TT: (608) 263-5408

Fax: (608) 262-8848

e-Mail: [vanderk@trace.wisc.edu](mailto:vanderk@trace.wisc.edu)

### **16. RERC On Telerehabilitation**

The goal of this RERC is to serve people with disabilities by researching and developing methods, systems, and technologies that support remote delivery of rehabilitation and home health care services for individuals who have limited local access to comprehensive medical rehabilitation outpatient and community-based services.

### **University of Pittsburgh**

School of Health and Rehabilitation Sciences  
Forbes Tower, Suite 5044  
Pittsburgh, PA 15260

Co-Principal Investigator: David M. Brienza, PhD

Co-Principal Investigator: Michael McCue, PhD

Contact: Jean Webb

Voice: (412) 586-6905

TT: (415) 383-6598

Fax: (415) 383-6597

e-Mail: [hjwebb+@pitt.edu](mailto:hjwebb+@pitt.edu)

## **17. RERC On The Universal Design And The Built Environment At Buffalo**

RERC on the Universal Design and the Built Environment completes research and develop critical tools for advancing the field of universal design and applies those tools to develop exemplar products and places through industry partnerships. Education and dissemination activities increase awareness of the RERC activities and universal design in general as well as improve capacity in research and practice. A model of “evidence based practice” guides all these activities.

### **University at Buffalo, The State University of New York**

School of Architecture and Planning

378 Hayes Hall

Buffalo, NY 14214-3087

Principal Investigator: Edward Steinfeld, Arch. D.

Contact: Edward Steinfeld, Arch. D.

Voice: (716) 829-3483 x 329

Fax: (716) 829-3861

e-Mail: [arced@ap.buffalo.edu](mailto:arced@ap.buffalo.edu)

## **18. RERC On Universal Interface And Information Technology Access**

The focus of this RERC is on both access to information in its various forms, as well as access to interfaces used within content and by electronic technologies in general. The research and development program is carefully designed to provide an interwoven set of projects that together advance accessibility and usability in a fashion that takes into account, and supports, the full range of access strategies used by manufacturers and people with disabilities.

### **University of Wisconsin-Madison**

Trace Research and Development Center

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8/22/06

1550 Engineering Drive, 2107 ECB  
Madison, WI 53706-1609  
Principal Investigator: Gregg C. Vanderheiden, PhD  
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e-Mail: [vanderk@trace.wisc.edu](mailto:vanderk@trace.wisc.edu)

### **19. RERC On Wheelchair Transportation Safety**

The goal of this RERC is to improve the safety of wheelchair users who remain seated in their wheelchair while using public and private motor-vehicle transportation. This RERC has active programs of information dissemination, training, and technology transfer using personnel, mechanisms, and facilities that have been previously established at the University of Pittsburgh/University of Michigan.

#### **University of Pittsburgh**

Department of Rehabilitation Science and Technology  
2310 Jane St, Suite 1300  
Pittsburgh, PA 15203  
Principal Investigator: Patricia Karg, MSBME  
Contact: Patricia Karg, MSBME  
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Fax: (412) 586-6910  
e-Mail: [tkarg@pitt.edu](mailto:tkarg@pitt.edu)

### **20. RERC On Wheeled Mobility**

The goal of this RERC is to undertake a major shift in the way wheeled mobility is conceptualized and understood, from the design of assistive devices that enable some individuals to perform some activities, to the design of a broad range of interventions that enable as many individuals as possible to actively engage and participate in everyday community life.

University of Pittsburgh

School of Health and Rehabilitation Sciences

Rehabilitation Science and Technology

Pittsburgh, PA 15260

Director: David M. Brienza, PhD; Clifford Brubaker, PhD

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Fax: 412-383-6597

TTY: 412-383-6598

## **21. RERC On Workplace Accommodations**

This RERC identifies, designs, and develops devices and systems to enhance the workplace productivity of people with disabilities. Universal design is a primary focus of the Center—making the design of products and environments usable by all workers to the greatest extent possible, without the need for adaptation or specialized design. The Center also studies archival materials to identify factors that contribute to successful or unsuccessful outcomes, and analyzes policies and practices that may influence the nature and availability of workplace accommodations for persons with disabilities.

### **Georgia Institute of Technology**

Center for Assistive Technology & Environmental Access

490 10th Street, NW

Atlanta, GA 30318

Co-Principal Investigator: Karen Milchus, MS, ATP

Co-Principal Investigator: Jon Sanford, M.Arch

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e-Mail: [karen.milchus@coa.gatech.edu](mailto:karen.milchus@coa.gatech.edu)

## **22. RERC For Ergonomic Solutions For Employment**

The overall goal of this RERC is to **prevent disability associated with musculoskeletal disorders and aging**. The core project concentrates on developing tools for evaluating workers and jobs and developing ergonomic solutions.

### **University of Michigan**

Center for Ergonomics

1205 Beal Avenue

Ann Arbor, MI 48109-2117

Director: Thomas J. Armstrong, PhD, Professor, Industrial and Operations Engineering

Phone: 734-615-2683

Fax: 734-764-3451

## **23. Smith-Kettlewell RERC**

This project conducts research and development for persons who are blind or who have visual impairments. It also explores novel approaches to graphics access by persons who are blind or who are deaf-blind. An innovative program of vocational and daily living technology development includes intensive interaction with service providers and applications of computer vision.

### **Smith-Kettlewell Eye Research Institute**

2318 Fillmore Street  
San Francisco, CA 94115  
Tel: (415) 345-2110,2114  
Fax: (415) 345-8455  
Director: John Brabyn  
e-mail: [RERC@ski.org](mailto:RERC@ski.org)

**F. Comments of the Rehabilitation Engineering Research Center on Telecommunications Access Submitted to the Federal Communications Commission on October 29, 2004; In the Matter of Review of the Emergency Alert System, WC Docket No. 04-296**

Gregg C. Vanderheiden, Co-Principal Investigator

Judith E. Harkins, Co-Principal Investigator

Karen Peltz Strauss, Of counsel

The Rehabilitation Engineering Research Center on Telecommunications Access (RERC-TA) submits these comments in response to the Federal Communications Commission's (FCC or Commission) Notice of Proposed Rulemaking (NPRM) on the Review of the Emergency Alert System. The RERC-TA is a joint project of Gallaudet University and the Trace Center of the University of Wisconsin, Madison and is funded by the National Institute on Disability and Rehabilitation Research of the U.S. Department of Education. The primary mission of the RERC-TA is to make communications technologies accessible to and usable by people with disabilities. The investigators of the center have served on several federal advisory committees on accessibility of equipment and services, and currently serve on the Network Reliability and Interoperability Council. We have commented on numerous FCC proceedings regarding the accessibility of "mainstream" technology and have presented at Summits hosted by the FCC. Some of the RERC staff were involved in the specification and testing of the accessibility procedures for people who are deaf as these are contained in the present emergency alert system.

Our comments are directed toward issues that would support improved and uniform access to emergency alerts by people with disabilities.

We commend the Commission for explicitly seeking comment on emergency-alert issues affecting people with disabilities. As the Commission has noted in this NPRM, an Executive Order issued by the President on July 22, 2004 underscores the importance of

accessibility of emergency alerts to people with disabilities. The intent of the Executive Order is “to ensure that the Federal Government appropriately supports safety and security for individuals with disabilities in situations involving disasters, including earthquakes, tornadoes, fires, floods, hurricanes, and acts of terrorism.” The directive calls for consideration of unique issues affecting people with disabilities and coordination of efforts at various levels of government[1]. The Emergency Alert System, upgraded and expanded to be more accessible to all and usable by people with disabilities, is an important component of emergency preparedness. The EAS is potentially an important set of channels for communication from the government to citizens in local and regional as well as national emergencies.

## **Responses to the NPRM**

### **a. General Considerations**

In assessing how to make government emergency alerts available and accessible, there needs to be an analysis of how to reach the most people at varying times of the day, including waking them while asleep for the most serious emergencies; and how to provide ways for people to elect to receive additional information in a modality that is accessible to them. The redundancy recommended in a report on the Common Alerting Protocol (Botherell, 2003[2]) would benefit people with disabilities along with the population in general. As stated in the report, “The key to effective public warning lies not in perfecting one system or technology, but in using all available means of communication in a coordinated and effective way.” Most people use different modalities and technologies for receiving communication and information, depending on the situation and their location at the time. The ability to be flexible in modality is critically important to alerting people with disabilities. It will also alert more of the general population faster, with fewer people ending up misinformed because they have heard third- or fourth-hand information.



## **b. Federal/State Program Responsibility**

Inspired by recent problems in the emergency response of the electric power grid, we are inclined to believe that having a single federal entity responsible for the management, consistency, and availability of the EAS system is the best choice. The origination of alerts with more local administrations is necessary and would be improved by instituting a more specific and consistent system-wide incident classification doctrine. The Department of Homeland Security does seem to be the logical home for the running of the EAS, given its other roles in emergency management. We note that an agency with this responsibility needs to have in-house expertise in disability issues sufficient to ensure accessibility in implementation of systems. Few agencies have this depth of expertise. However, we are pleased to see that the Department of Homeland Security has set up the Interagency Coordinating Council on Emergency Preparedness and Individuals with Disabilities, and that this agency is gearing up with projects and staffing to provide expertise for safeguarding accessibility. We recommend that the FCC's Disability Rights Office be represented on the Interagency Coordinating Council and that staff of NOAA who have worked on making the NOAA Weather Radio system accessible also be involved.

It has been our experience that public-private partnerships are beneficial in ensuring that new policies are implemented effectively. The Partnership for Public Warning (PPW) has been doing a valuable public service through its work on the Common Alerting Protocol, through its assessment of the EAS, and through bringing industry and subject matter experts together. We support the idea of public funding for PPW's work and support their leading this effort.

We agree that the voluntary nature of EAS alerts (except if ordered by the President) leads to disuse of the system in some areas and uneven implementation. We believe that state-level planning is necessary and that accessibility requirements must be made part of the state plans.

Carriage of EAS alerts should be made mandatory, but there needs to be better encoding of the information to trigger mandatory alerts, so that the public does not become desensitized if alerted to too many minor incidents, or receive alerts after the emergency has passed. We ask that sociological research be utilized, and that more up-to-date research be done to understand the public's response to alerts on newer technologies, and the ways in which people communicate and obtain information after the alert. These studies need to include people with disabilities, including those who are elderly.

Uniform national guidelines that include accessibility provisions are needed. As the use of technology has changed, the accessibility of the current EAS has changed. The system needs to be accessible to all even as technology changes.

### **c. EAS Structure and EAS Codes**

We agree that the message-relay structure of the EAS is outdated and needs to be changed so that all media and communication technologies can receive the information as quickly as possible. We also agree that more codes are needed. We suggest that industry alone should not bear all of the costs of upgrading the U.S. official alerting system.

When this is the case, we as a society tend to get less than we need; for example, very small cable systems have different requirements for EAS accessibility than large cable systems because of the understandable concern about burdens on small businesses. But the person with a disability who has the misfortune to subscribe to very small cable system (e.g., because a small system serves the person's apartment building) may find that he or she has limited or no access to the EAS. This is a function that government should help to support and stimulate through funding. This is yet another reason for looking to the Department of Homeland Security for oversight, as the FCC is presently not authorized to distribute this type of funding.

### **d. Expanding EAS Requirements to Other Services**

The FCC asks about the extent to which EAS requirements should be expanded to newer

technologies, including digital television. Insofar as the FCC has ordered the phase-out of analog television and the phase in of digital television, obviously digital television must carry EAS messages. When Congress decided to grant broadcasters digital television spectrum at no cost, it understood that along with these free licenses would come an obligation to meet certain public interest mandates. One of these is for digital broadcasters to meet the emergency needs of its viewers. Where these broadcasters make the decision to broadcast multiple streams on the frequencies they have been awarded, they are making a business decision designed to maximize profit. In this situation, their public interest obligation to meet the emergency needs of their viewing audience must extend to carrying EAS alerts on all of those streams. Force tuning should not be necessary.

#### **e. Alternate Public Alert and Warning Mechanisms**

The public has many entertainment alternatives to watching live TV and listening to radio. Tens of millions of Americans are at any given time in the presence of a mobile device and/or a computer screen. Telecommunications technologies and the Internet are obviously underutilized for alerting the public. Over time the EAS should move to a more interactive format; that is, once alerted, interactive methods should be utilized to allow the public to seek additional information in the same modality as the original message. For example, an incoming text message on a mobile device could include a prompt for “more” and more information could be called up in text. An incoming voice message over a mobile phone could prompt for “more” and more information could be delivered by voice. These and other interactive technologies need to include voice, text (including email and web among other methods), and as possible, video options.

Historically the EAS and its predecessors were driven by the power of emerging technologies to reach people quickly in times of crisis. The focus has been on radio, broadcast television, and later cable television. It has long been recognized that on average, people attend to these broadcast technologies for only a small part of their day, and this limitation of the EAS is noted in the NPRM. People who have disabilities of

hearing and/or sight generally attend to these technologies even less than others, because the technologies are only marginally accessible or completely inaccessible. For example, radio is completely inaccessible to people who are deaf and to many who are hard of hearing, and yet radio is a particularly important medium during power outages because of the wide availability of battery powered radios and the ability to use an automobile radio. Television is not an accessible medium to people who are blind, and during emergencies, on-screen text and graphics that carry important facts are not available in speech form so that blind people can access the information. As noted in comments by the American Foundation for the Blind, the requirement in Section 79.2 to read emergency information (“open” video description) that appears on the screen is routinely ignored, despite repeated reminders issued by the Commission.[3]. And unfortunately, local emergency coverage on television is often inaccessible to people who rely on captions, despite FCC requirements contained at Section 79.2. (See Appendix I) Moreover, public address systems in buildings, transportation depots, hospitals, and other facilities are inaccessible to people who are deaf or hard of hearing. Face to face communication is often not possible, so even word-of-mouth cannot be used. These problems underscore the need to use as many technologies as possible in order to fill some of the important gaps in access to emergency information.

To reach people who have disabilities on a more equitable basis, not only does EAS delivery and Section 79.2 delivery of accessible audio and video information need to be improved, but other technologies – particularly Internet and mobile devices -- must be used in addition to these original communication media. As noted in the NPRM, the voluntary expansion of mass-alerting functions into additional technologies, including cell phones and pagers, has not been driven by the marketplace, despite flexibility built into the current generation of EAS. These newer technologies should not be viewed or classified as "alternative" since they are very much mainstream technologies that have greatly extended the possibilities for government alerts to the American public. Because tens of millions are connected to the Internet during the workday and tens of millions are connected via mobile devices, these technologies must be included in the EAS in order to reach people where they are. Location-based systems that are being built into mobile

networks for E-9-1-1 implementation should be utilized for allowing greater precision in the delivery of alerts based on the geographic location of the mobile device.

EAS alerting is based on the media concept that the person is watching or listening to the media source and will receive the message as part of the viewing/listening experience. However, when people are not attending to a media source, as when mobile, asleep, or otherwise busy, the device needs to be activated. We suggest that alerting by phone and messaging be done with a unique signal (tone for phones, vibration pattern for “silent” mode of phones and pagers) that is recognized as an emergency signal and that is used only for situations of great urgency. If such an approach is taken, the audio signal should sweep across frequencies and be repeated so that it attracts attention as well as being able to be heard by hard of hearing people.

Since the time spent in the car is quite long for many Americans, passengers and drivers needs to have a way of receiving EAS messages. The car radio is the usual technology for this but radio is not accessible to people who are deaf and hard of hearing. We recommend use of the Radio Band Data Services in the EAS so that text alerts can appear on car radios that have displays.

We support the Common Alerting Protocol approach as one that supports accessibility by ensuring that everyone receives the same message and not a truncated version. It supports flexible modalities and redundancy of outlet for messages. With proprietary protocols, the opportunities for accessibility are more limited because the owner of the technology must agree to implement accessibility provisions; the CAP provides an open platform for flexible-modality alerts.

We also support greater government efforts to have devices automatically turn on in the event of a serious emergency alert. NOAA Weather Radios have this feature and an industry standard has been developed by the Consumer Electronics Association for a Public Alert Receiver that includes this feature. We recommend that this feature become

required for various types of consumer electronics that are capable of receiving broadcasts and messages, including car radios.

Another receiver-issue is support of closed caption decoding in small, battery operated televisions. Although the current emergency alert system does not directly address closed captioning, the importance of closed captioning of emergency information cannot be overstated. During power outages, the radio is unavailable to people who are deaf and so caption decoding in battery operated televisions is needed as a requirement. Although some of these televisions are below the size cutoff (13 inches diagonally for analog receivers or 7.8 inches vertically for digital receivers) that triggers the decoder requirement, these devices should be required to include closed caption decoding capability.

#### **f. Public Warnings and Alerts for Individuals with Disabilities**

We have commented above on the many EAS issues that pertain to accessibility. Our point is that virtually all considerations with regard to the EAS can, in the end result, have an effect on the accessibility and availability of a message when it is sent out from the government.

Particular care needs to be taken to ensure that both existing and new technologies for alerting are accessible. There can be an "accessibility drift" over time that leads to erosion of a requirement's intent. For example, blind people have less access to televised EAS messages than they used to. Since breaks in the audio portion of programming are unpopular and discourage voluntary use of the EAS, visual information in the form of crawls or other screen graphics have become more commonplace. When a voice message is not included in the alert, the result is that people who are blind may hear the audio alert signal "squawk" and know only that something is wrong, while being unable to learn immediately what the warning is about. In other words, they are not served by the EAS as currently implemented, and are deprived of the ability to respond in a timely fashion to an emergency. The same type of problem occurs when deaf people see a breaking news

story and get only a headline without captions or specific information on the event.

Sometimes laudable attempts to make emergency information available in multiple modalities can fall short of full accessibility. For example, the NOAA Weather Radio has a text mode and text radios have been developed for access to weather alerts. Officials at the National Weather Service are to be commended for encouraging the development of this capability and for doing outreach to the deaf and hard of hearing communities. But it is unfortunate that the full text message of the alert (counterpart to the audio message) is not provided. Only the truncated statements based on the SAME codes are included. This factor makes these products less attractive as warning devices. This unfortunate situation is also ironic, because the original modality for the message is text which is then converted to synthetic speech. To make full text be sent across the NWR system, text servers would need to be in place in the broadcast system. This would require an expenditure of funds. This is an example where equivalency can fall between the cracks unless someone has explicit responsibility for carrying it out and a means of funding accessibility maintenance and improvements.

The Commission notes that other parts of its rules, contained at 47 CFR §79.2, specify triggering events and methods for the emergency transmittal of information, and asks whether there are disparities in or conflicts between its EAS rules and those contained in Part 79.

In fact, at present, the Commission has not two, but three separate sets of rules that cover the notification of people with hearing and vision disabilities in the event of an emergency. The oldest of these, promulgated in 1978, covers television broadcasts only and is contained at 47 CFR 73.1250(h). This rule seems to only cover broadcasts, and requires emergency information to be transmitted “both aurally and visually or only visually,” and allows stations to use “any method of visual presentation which results in a legible message conveying the essential emergency information.”

EAS rules, which are contained at Part 11 and extend to both broadcast and cable

stations, can supercede the above broadcasting rule where necessary. EAS is to be used for national emergencies as determined by the President. It may also be activated at the local level for “day-to-day emergency situations posing a threat to life and property.”

In 2000, the FCC issued yet another set of regulations covering emergency programming notification. These rules cover all video programming, including broadcast, cable and satellite services. While the scope of all three of the above regulations are similar – covering extreme weather situations such as floods, hurricanes, earthquakes, as well as civil disorders, toxic gas leaks and other man-made disorders,[4] the language of both the broadcasting rule and the EAS rules seems to stop at information needed to protect life and property, while the language of the programming accessibility rule at Part 79 extends to information intended to further the protection of safety and health as well.

In addition, only the Part 79 emergency accessibility rules specifically require that information about the critical details of an emergency be made accessible, including information on how to respond to the emergency, evacuation orders, shelters, road closures and securing assistance. By contrast, the EAS rules seem to require only that the visual message contain “the Originator, Event, Location, and the valid time period of the EAS message,”[5] and the 1978 broadcasting requirement is silent on this issue.

A third difference between the three rules is that only the Part 79 rules apply to all video programming distributors, regardless of their size, subscriber base, or transmission format. The EAS rules are divided by the number of individuals subscribed to a cable system, with smaller systems – systems having fewer than 5000 subscribers having a lesser obligation. These smaller systems must only provide a video interruption and audio alert message on all channels, while systems with 5000 or more subscribers must provide their EAS messages aurally and visually on all of their channels.[6]

The discrepancies and disparities in these three sets of rules need to be reconciled in order to ensure that Americans who are deaf, hard of hearing, blind and low vision have the information they need to adequately respond in an emergency. The problem with



leaving the rules as they now exist can be shown by what would happen in the event of a national emergency. Although the emergency accessibility rules contained in Part 79 would require all cable providers to make all critical details concerning that emergency visually accessible, under the EAS rules, the national activation of a Presidential message would “take priority over any other message and preempt it if it is in progress.”[7] In addition, all television broadcast network program distribution facilities would need to be reserved exclusively for the distribution of that message.[8] The danger here is that even though the rules under Part 79 may be more suited to providing people with disabilities more comprehensive information in the event of a national emergency, as written, the EAS rules would preempt those rules.

It is critical that the FCC reconcile the differences contained in these three sets of rules in a manner that is designed to apply the broadest range of protection and coverage for individuals who are deaf, hard of hearing, blind and vision impaired. It appears that the FCC’s Part 79 programming accessibility requirements are the widest in scope and coverage, both in terms of triggering events and transmission methods, and we would suggest that the FCC look to these in an attempt to bring all three rules in accord with one other. But as the FCC goes about this process, it should take note of the fact that existing rules for individuals who are blind remain largely inadequate. Even under the Part 79 rules, emergency information that is not part of a regularly scheduled newscast or which interrupts regular programming must only be accompanied by an aural tone. Individuals who hear this tone may not know what it means, yet there is no additional requirement to direct these viewers about what they need to do once they hear the tone. In addition, it may be that there are no alternatives to television for obtaining additional information, if other sources have gone down or been temporarily disabled.

Moreover, when the FCC promulgated its Part 79 rules, it was reluctant to require all emergency information to be provided via closed captions, out of concern that there were limited real-time captioning resources. Over the past few years, these resources have continued to grow, filling gaps that used to exist. We recommend that any new rules on emergency programming make clear that captioning is needed to fully and effectively

convey televised emergency information. Although closed captioning may suffice, it is preferable that such information be provided in an open caption format. This will ensure that hard of hearing people, and in particular senior citizens who may not have their captions turned on, will receive the intended messages.

**g. Other Issues**

Improved enforcement of the accessibility provisions of the EAS as well as Section 79.2 mandates, along with a consistent system of alerting nationwide, will be necessary to ensure effective and comprehensive access to emergency information in the future. History has shown that lack of access to emergency messages has not been treated as a serious breach of policy by the Commission and without more attention to these issues, we will continue to see an absence of visual and audio information needed to ensure that everyone has equal access to this vital information.

Community education about the EAS is needed, and efforts at public education must be accessible. This includes making materials available in alternate formats. Virtually every decision point on the EAS will have an effect on the ability of people with disabilities to obtain emergency information on an equitable basis with those who do not have disabilities. The expansion of emergency alerting into technologies that Americans use today will benefit people with disabilities by providing a choice of modality and reaching them wherever they are. Attention to accessibility provisions for broadcast technologies and cable is needed for even basic access to today's alerts. We commend the Commission for addressing the need to upgrade the EAS and make it more useful to the American public, including people with disabilities.

Respectfully Submitted,

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For a PDF version of this section, please visit;  
<http://trace.wisc.edu/docs/2004-FCC-04-296/FCC-04-296.pdf>

For RERC on Telecommunications Access Home Page, please visit;  
<http://trace.wisc.edu/telrerc/>

## **G. RERC Accessibility Resources**

This heading contains additional information regarding the RERCs and accessibility. It may also contain content that can be found elsewhere on this site. These accessibility resources have been gathered together, in this separate section, to provide easy availability to those for whom accessibility is a foremost concern.

- 1. Rehabilitation Engineering Research Center on Mobile Wireless Technologies for Persons with Disabilities Website**  
<http://www.wirelessrerc.gatech.edu/index.html>
- 2. The Wireless Rerc's Assistive & Accessible Technology Links**  
<http://www.wirelessrerc.gatech.edu/info/aat.html>
- 3. Rehabilitation Engineering Research Center on Telecommunications Access Webpage**  
<http://trace.wisc.edu/telrerc/>

**4. Accessible Emergency Notification and Communication Conference**

**Webcast: November 2<sup>nd</sup> – 3<sup>rd</sup>, 2005**

<http://www.tvworldwide.com/events/nod/051102/default.cfm>