

# Radiation Safety Without Borders Initiative

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## Abstract

The Radiation Safety Without Borders (RSWB) initiative provides peer support to radiation safety professionals in developing countries, which bolsters the country's infrastructure and may lead the way for IRPA Associate membership. The Health Physics Society (HPS) recognizes that many nations do not possess the infrastructure to adequately control and beneficially use ionizing radiation. In a substantial number of countries, organized radiation protection programs are minimal.

The RSWB initiative relies on HPS volunteers to assist their counterparts in developing countries with emerging health physics and radiation safety programs, but whose resources are limited, to provide tools that promote and support infrastructure and help these professionals help themselves. RSWB experience to date has shown that by providing refurbished instruments, promoting visits to a HPS venue, or visiting a country "just to look" provide valuable technical and social infrastructure experiences often missing in the developing nation's cadre of radiation safety professionals. HPS/RSWB with the assistance of the International Atomic Energy Agency (IAEA) pairs chapters with a country, with the expectation that the country's professional radiation safety personnel will form a foreign HPS chapter, and the country eventually will become an IRPA Associate.

Although still in its formative stage, RSWB nonetheless has gotten valuable information in spite of the small number of missions. The RSWB initiative continues to have significant beneficial impacts, including:

- Improving the radiation safety infrastructure of the countries that participate;
- Assisting those countries without professional radiation safety societies to form one;
- Strengthening the humanitarian efforts of the United States;
- Enhancing Homeland Security efforts through improved control of radioactive material internationally.

Developing countries, including those in Latin America, underwritten by IAEA, may take advantage of resources that HPS members can provide with very little effort. Such items as refurbished hand-held survey instruments and professional journals expand the scope of many programs that lack the vital radiation protection infrastructure we take for granted.

Although the HPS with its RSWB initiative has no requirement to fill infrastructure voids, a visit from a HPS volunteer professional sometimes can form a bridge that will help build the infrastructure. Even a short visit could provide valuable information about the status of a country's infrastructure. HPS Chapter volunteers then can proceed to help their professional counterparts, providing the much-needed support for the eventual buildup of their radiation protection infrastructure. It is anticipated that RSWB's long term vision to support developing countries' health physics infrastructure, and eventual IRPA Associate membership, will continue to be supported by this and future HPS administrations.

***KEYWORDS: radiation, protection, infrastructure, assistance, professional, volunteer***

## 1. Introduction

The Radiation Safety without Borders (RSWB) program had its beginnings within the Health Physics Society (HPS) in 2001 [1]. The original **purpose** of the RSWB program was to *provide a group of volunteers, who, collectively, have expertise in a number of radiation (ionizing and non-ionizing) safety related areas.*

Through cooperation with international agencies, specifically the International Atomic Energy Agency (IAEA), these volunteers would be available to assist developing countries improve their radiation safety programs, where needed.

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The original **scope** of the program *was intended to be focused on assisting those countries with emerging health physics and radiation safety programs, but whose resources are limited.*

Through this program, subject matter experts would be available to help organize a radiation safety infrastructure, organize and/or provide training in radiation safety, provide and train personnel to use basic radiation safety equipment, assist in locating lost radiation sources, or any other activity that would support the enhancement of radiation safety in the host country. The foundation of the Radiation Safety without Borders program is the voluntary participation of individual HPS Chapters and individual chapter members.

The original **goal** of the program *was to facilitate peer-to-peer communication regarding radiation safety practices, procedures, and information with the fewest possible number of intermediaries.*

Initially, nine HPS Chapters volunteered to participate in the program. These chapters and their assigned countries were:

- East Tennessee – Estonia
- Florida – Jamaica
- Greater New York & New England – Portugal
- Northeastern New York – Ecuador
- Northern California – Panama
- South Texas & North Carolina – Costa Rica
- Western New York – Lithuania

From this list, a pilot program, involving South Texas (for Costa Rica), Northern California (for Panama), Florida (for Jamaica), and Northeastern New York (for Ecuador) was established through an agreement with the U.S. State Department. Under this project, travel and expenses were paid to chapter members who traveled to the sponsored country through individual service contracts, with no administrative fees or expenses to the Chapters or the Society. Trips were taken by South Texas, Florida and Northern California Chapters to their respective sponsored countries. Unfortunately, the funding was suspended before the Northeastern New York Chapter could complete its trip. In addition, independent of the pilot program with the U.S. State Department, contacts were made by the Western New York Chapter under RSWB and a trip was made to Lithuania. Overall, the trips that were taken were an undeniable technical success, and the experiences of the travelers are summarized in the *Health Physics News* [2].

After an extended period of relative inactivity, the RSWB initiative was rejuvenated by then HPS President Brian Dodd. The Radiation Safety without Borders Revitalization Ad Hoc Committee was commissioned by the HPS Board at the Scottsdale Midyear on 22 January 2006 and its life was extended by the HPS Board at the Portland Annual Meeting to July 2008. During its 2.5 year tenure, the RSWB Ad Hoc Committee simplified protocols, which led the way for individual chapters to participate more informally. In the interval, seven chapters agreed to partner with a country identified by the IAEA as in need of technical support. Lack of radiation safety infrastructure was identified as the overarching shortcoming among all developing countries.

## **2. Radiation Safety without Borders Initiative**

The purpose of RSWB is to provide a group of volunteers from the Health Physics Society, who, collectively, have expertise in a number of radiation safety related areas. Through cooperation with international agencies such as the IAEA, these volunteers are being made available to assist developing countries improve their radiation safety programs where needed. The scope of this assistance is being focused on assisting those countries with emerging health physics and radiation safety programs, but whose resources are limited. Under the RSWB umbrella, the HPS provides subject matter experts to assist developing countries with technical, regulatory, and administrative challenges in the radiation safety field.

Regarding the IAEA, RSWB helps the Agency achieve two goals in their medium-term strategy [3], namely:

1. Comprehensive and effective international frameworks for promoting nuclear safety and security
2. Enhancement of cooperative interaction with partners and public to achieve the Agency's goals.

Relative to the first goal, RSWB promotes IAEA objective B.2 to achieve global acceptance of international safety standards by working in cooperation with other international organizations and professional bodies. Also, RSWB promotes IAEA objective B.3 to establish and achieve global acceptance of an international framework for nuclear security by enhancing cooperation with other international and non-governmental organizations.

Relative to the second goal, RSWB promotes IAEA objective D.2 to enhance the impact of the Agency's work through strengthened relationships with scientific and technical institutions and the private sector by developing new partnerships and promoting the sustainability and self-sufficiency of scientific and technical institutions.

The RSWB initiative provides peer support to radiation safety professionals in developing countries, which bolster the country's infrastructure and may lead the way for IRPA Associate membership. The HPS recognizes that many nations do not possess the infrastructure to adequately control and beneficially use ionizing radiation. In a substantial number of countries, organized radiation protection programs are minimal. Several severe accidents involving ionizing radiation have occurred in developing countries that have resulted in serious injuries or death [4-9]. Likewise, there are concerns in the United States because of the potential uses of radioactive materials by terrorist organizations.

The original 2002 HPS international safety initiative (RSWB) continues to have significant beneficial impacts, including:

- Improving the radiation safety infrastructure of the countries that participate;
- Assisting those countries without professional radiation safety societies to form one;
- Strengthening the humanitarian efforts of the United States;
- Enhancing Homeland Security efforts through improved control of radioactive material internationally.

### **3. RSWB Experiences**

RSWB program was officially launched with representatives from the four charter RSWB chapters during the June 2002 American Radiation Safety Conference and Exposition in Tampa, Florida. Also present at the meeting were personnel from the U.S. State Department Nonproliferation and Disarmament Fund. Discussions centered on the importance of source control as an essential radiation safety practice, and how several recent overexposure events in the region had stemmed from inadequate source controls. Events in Panama and El Salvador were cited as examples [5, 6]. As a result, the South Texas Chapter visited Costa Rica, the Northern California Chapter visited Panama, and the Florida Chapter visited Jamaica. Since then, several other HPS Chapters have made significant RSWB contributions. In many cases, the HPS Chapters collaborated with a university or governmental agency in supporting the various RSWB initiatives. The following paragraphs summarize a few of the Chapter RSWB initiatives.

#### **3.1 South Texas Chapter**

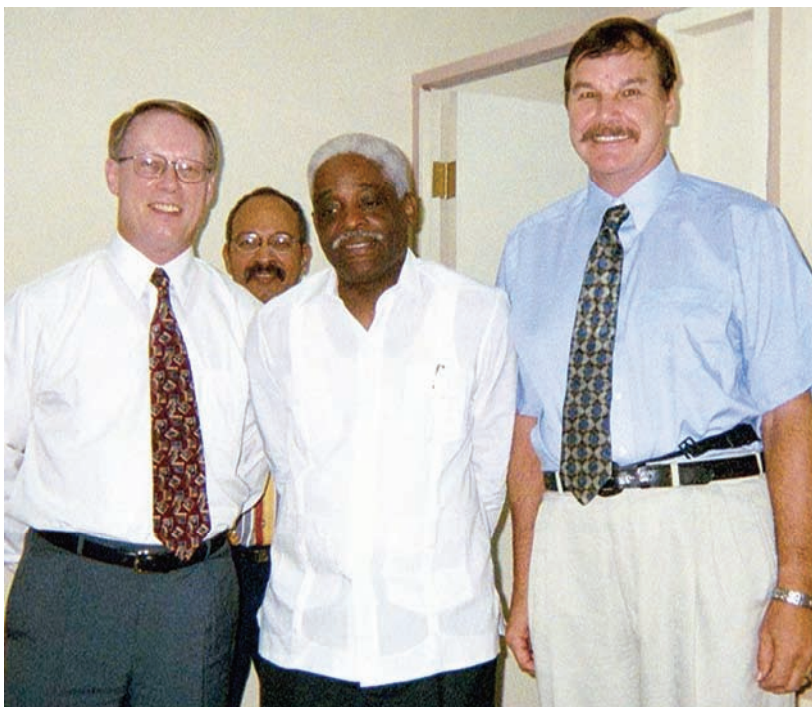
As one of the four charter member Chapters of the RSWB initiative, the South Texas Chapter of the Health Physics Society (STCHPS) selected Costa Rica as its partner country. This selection was made partially due to the existing working relationship between Costa Rica and the University of Texas Health Science Center at Houston School of Public Health, which has enjoyed a longstanding and productive partnership with the STCHPS. After completing a preliminary assessment of the possible radiological needs of Costa Rica, arrangements were made for the first in-country site visit. In late August 2002, a site visit was conducted that included formal introductions with key radiation safety

officials, technical training, site tours, identification of specific training needs and opportunities for future collaboration. The trip proved to be an educational experience for all parties involved, and the lessons learned from this experience can serve to assist other chapters wishing to become involved in this very worthwhile international exchange program [10]

### 3.2 Northern California Chapter

The Northern California Chapter of the Health Physics Society (NCCHPS) initial involvement with the Radiation Safety without Borders program was highly successful. An official visit to Panama met both its mission and objectives of providing volunteers from the NCCHPS to assist Panama to improve its radiation safety programs which faced technical, regulatory, and administrative challenges. As shown in Fig 1, two representatives of NCCHPS met with two representatives from the Panamanian Department of Radiological Health.

**Figure 1:** Northern California Chapter members met with representatives of the Panamanian Department of Radiological Health.



The NCCHPS trip was taken as a part of the State Departments Nonproliferation and Disarmament Fund (NDF) Project 167, Control of Radioactive Sources in Latin America [11]. This pilot project sent volunteer Chapter health physicists to two countries that had requested assistance in improving the security and safety of their radioactive sources, including calibration, maintenance, and repair of radiation detection and measurement equipment used in these applications. RSWB, as part of this program, partnered with the IAEA to achieve two of IAEA's goals for a comprehensive and effective international framework for promoting nuclear safety and security, and enhancement of cooperative interaction with partners and public [3].

### 3.3 East Tennessee Chapter

Sometime in late January 2003 the staff at the Estonian Radiation Protection Center (ERPC) received a rather large shipment, certainly a first of its kind for this Baltic state. The East Tennessee Chapter of the Health Physics Society (ETCHPS) sent four hundred and seventy eight (478) Health Physics Journals to ERPC library under the RSWB program (see Fig. 2). The ETCHPS covered the shipping expenses as part of its RSWB program budget. The collection is available to students enrolled at the nearby University of Tartu for their studies and research.

**Figure 2:** East Tennessee Chapter's donation resides in the Estonian Radiation Protection Center library



### **3.4 Eastern Idaho Chapter**

In June 2007, representatives of the Eastern Idaho Chapter of the Health Physics Society (EICHPS) met with the founding members of the Georgian Health Physics Association (GHPA) in Tbilisi, Georgia. Initial contact with Georgia arose as part of a research project "Tbilisi Radon Initiative" between Idaho State University (ISU) and Tbilisi State University, which serves as a great avenue for basic health physics education and promotion. The first full GHPA chapter meeting in Georgia took place the following month, where new officers were elected and the bylaws were reviewed for some minor edits so that the organization could be officially registered in Georgia as a non-governmental organization (NGO). This meeting included individuals appointed to the President of Georgia's commission for investigating needs and aspects for nuclear power in Georgia. Some members were IAEA points of contact for technical cooperation grants in Georgia.

ISU students translated GHPA members' curriculum vitae to facilitate matching them with Eastern Idaho Chapter members. EICHPS also is helping GHPA with the payment of HPS dues and exchange with U.S. professionals.

### **3.5 Rio Grande Chapter**

A representative of the Rio Grande Chapter developed a working relationship with health physicists in Tanzania. Tanzania presents a challenging environment to work in, both from an economic standpoint and trained human resource shortage. The Head of the Tanzanian Atomic Energy Commission has expressed a particular interest in the RSWB relationship with the HPS.

The Health Physics Journal editor has helped by supplying Tanzanians with surplus Journals, which they pass around and share with all their colleagues. A Rio Grande Chapter representative has also been able to provide some radiation detection equipment from the U.S. National Nuclear Security Administration under the search and secure program for orphan source recovery and illicit trafficking management.

### 3.6 Western New York Chapter

Late in 2007, the Western New York Chapter of the Health Physics Society (WNYHPS) passed a resolution to "... support Cornell University's Radiation Protection Internship program for a Nigerian national." WNYHPS expects Lagos State University will be sending their senior radiological health specialist to the annual HP meeting in Pittsburgh to be followed up with a 2-week internship at Cornell University that will provide extensive first-hand experience with the campus radiation safety program.

As a complement to this effort, Cornell is donating surplus radiation detection equipment to Lagos State University. As shown in Fig. 3, the first set of surplus equipment has already arrived. This included a half-dozen GM survey instruments and one microrem meter.

**Figure 3:** Surplus radiation detection equipment donated to Lagos State University in Nigeria by Cornell University



### 3.7 Florida Chapter

Florida Chapter of Health Physics Society (FCHPS) representatives visited to Jamaica in January 2004 and worked with both the Jamaican government and the university. The FCHPS gave them some used equipment and assisted the IAEA in updating their country profile.

Also in 2004, a FCHPS representative was asked to go with IAEA to the Bahamas to help them with a Radiation Safety and Security of Radioactive Sources Appraisal (RaSSIA) mission [12]. The mission revealed the shortcomings of the country to effectively control radioactive sources. Because the Governor of Florida had the Building Bridges with Our Neighbors, the state of Florida was interested in making sure that the Bahamas had control of radiation sources. The interests of the FCHPS aligned with those of the IAEA, some consulting medical physicists (providing services to the hospitals in the Bahamas), and the U.S. State Department support for the mega-port initiative in Freeport.

As a result, the Florida Bureau of Radiation Control (mostly FCHPS members) has provided training to their Bahamian counterparts with IAEA support for travel costs. Additionally FCHPS also provided the Bahamas with Florida state radiation regulations, pertinent NRC information, and information on emergency response. FCHPS is pleased to note that Bahamian environmental health officials have since conducted an inventory of medical radiation sources, and they have provided training to customs and law enforcement personnel.

Most recently, at their own expense, the FLCHPS hosted Anthony Ryan, a representative of the Bahamian environmental health services, at the October 2007 Fall Chapter meeting (see Fig. 4) [13].

**Figure 4:** HPS and Florida Chapter representatives met with Anthony Ryan, Commonwealth of Bahamas, in October 2007.



#### **4 The IAEA Interface**

The HPS is recognized by IAEA as a non-governmental organization (NGO). It should be possible to construct a Memorandum of Understanding between the IAEA and the HPS to facilitate RSWB activities in IAEA member States with a focus to create a consortium of peer professionals that eventually might form the core of a foreign HPS chapter and in time, with government or ministry approval, might lead to IRPA affiliation. Statistics show that those countries with professional radiation safety societies perform better regarding the creation and implementation of radiation protection infrastructure [14].

The IAEA representative suggested that we link the introduction of the RSWB program in developing countries to major events, such as IAEA Regional Coordination Meetings. It was felt that the topic of professional associations could readily be added to the agenda at these meetings, thus producing a greater awareness of this new program in the regions where we wish to start.

In April 2007, IAEA provided a list of country points of contact (POCs) that may be of value in connecting our Chapters to the respective countries even without the formal introductions by the IAEA.

#### **4. The Process**

The RSWB initiative relies on HPS volunteers to assist countries with emerging health physics and radiation safety programs, but whose resources are limited, to provide tools that promote and support infrastructure and help these countries help themselves.

Various agencies and sectors in the US have shown that by providing reused refurbished instruments, promoting visits to a HPS venue or visiting a country “just to look” provide valuable technical and social infrastructure experiences often missing in the developing nation’s cadre of radiation safety professionals. HPS/RSWB with the assistance of the IAEA pairs chapters with a country, with the expectation that the country’s professional radiation safety personnel will form a foreign HPS chapter, and the country eventually will become an IRPA associate.

The RSWB initiative, whether in its original form or revitalized, is a process that could require many years to realize the goal of International Radiation Protection Association (IRPA) affiliation for developing countries. To accommodate the long-term goals for IRPA affiliation, operational protocols were informalized – relaxed – to encourage peer to peer association without the burden of external (e.g. U.S. State Department or IAEA) approval protocols. The RSWB Committee, with modest assistance from IAEA, identified Chapter points of contact (POCs) and several Chapters have signed on to actively support RSWB initiatives as the program evolves. IAEA endorsed the RSWB mission at the Portland meeting during which the RSWB Committee presented a special session describing recent successful peer-to-peer associations in developing countries.

Mechanisms for implementing RSWB include Chapter/personal contacts, IAEA formal contacts, Pan-American Health Organization/World Health Organization (PAHO/WHO) support, or other mechanisms. Clearly there is some merit to all the options; however, pursuing the IAEA option would facilitate government sponsorship and support, which could be built upon by developing one-to-one professional relationships as we progress. It also would greatly simplify the liability management issues. Unfortunately, IAEA has not been responsive to our initiatives nor have they honored their commitments to the HPS.

In countries that are not IAEA member States, the PAHO/WHO route may prove more expeditious. However RSWB could serve to be an integrator of programs and facilitate optimum implementation of professional support, whatever the source.

Scientists without Borders (SWB) type of program offers another avenue to promote RSWB program [15]. Basically they have launched a database to announce the availability of scientific expertise and resources to developing nations. We could take advantage of existing models from other organizations/associations, such as SWB.

## 5. RSWB Chapter Volunteers

The process to become a RSWB volunteer begins with the Chapter determining members’ interests with the expectation to provide long-term follow-up. For Chapters whose members have professional colleagues or associates in a developing nation, an initial introduction may mean an invitation to a chapter event or an official HPS annual or midyear meeting.

HPS chapters interested in supporting a country should select a Point of Contact (POC), which may be the President of the Chapter or another person identified for such task, and advise the RSWB Committee Chair of their interest. The Chapter should identify special strengths, e.g., medical physics or regulations or availability of instrumentation. This first effort assists the IAEA in assessing a country’s needs in relation to the Chapter’s assets to better match the country and its POC to the Chapter. Current Chapter-Country pairings are shown in Table 1.

**Table 1:** Current Chapter-Country pairings

<b>RSWB Chapter Country Pairings</b>	
<b>Chapter</b>	<b>Country</b>
Buckeye	Bosnia/Macedonia
Connecticut	Venezuela
Eastern Idaho	Republic of Georgia
Florida	Bahamas/Jamaica
Northeastern New York	Ecuador
Northern California	Panama
South Texas	Costa Rica



## 6. Summary of current RSWB program

The current RSWB program can be summarized as follows:

- The countries we will preferentially choose to pair with will be those without a professional radiation safety society.
- We are a society of professionals and the best thing we can do is to help our peer professionals in developing countries in a person-to-person relationship-based way.
- A Chapter would link itself to a country ‘for life’ ...sort of like the sister city approach.
- The Chapter members over a number of years would get to know the professional HPs in that country, their culture and their regulations, and how to best support them in their work.
- The ultimate objective would be to help the folks in the country eventually develop their own IRPA-affiliated professional radiation safety society.
- A stepping stone to getting to that point would for the HPS Chapter to help them form a foreign HPS Chapter, which over time (years probably), and with support from their U.S. colleagues could grow to become an independent national society, formally disaffiliate with the HPS (but maintain personal ties), then apply for IRPA Associate Society status.

The RSWB program has identified countries that appear to have special radiation safety infrastructure needs and lack a national health physics professional society. These have been grouped into priority 1 (greatest need) and priority 2 (next greatest need) nations, see Table 2.

**Table 2:** List of priority countries for RSWB alignment

Priority for Radiation Safety Infrastructure Support						
Priority 1 Countries			Priority 2 Countries			
Benin	Haiti	Honduras	Senegal	Albania	Jordan	Saudi Arabia
Botswana	Kyrgyzstan		Seychelles	Armenia	Kazakhstan	Tanzania
Cameroon	Lebanon		Sierra Leone	Azerbaijan	Kenya	Tunisia
Chad	Libya		Sri Lanka	Bangladesh	Kuwait	UAE
Cote d'Ivoire	Mali		Tajikistan	Belarus	Moldova	Ukraine
D.R. Congo	Malta		Thailand	Bolivia	Mongolia	Uzbekistan
Eritrea	Mauritius		Uganda	Columbia	Nicaragua	Vietnam
Gabon	Nambia		Zambia	Dominican Rep	Paraguay	Yemen
Guatemala	Niger		Zimbabwe	Indonesia	Qatar	

HPS is considering workshops for HPS members who might volunteer for RSWB projects/missions. These workshops could be held in conjunction with the annual or midyear HPS meetings or could be hosted by a Chapter locally.

The RSWB program was founded on the voluntary participation of individual HPS Chapters and individual chapter members. In the HPS vision of the RSWB program, a Chapter would link itself to a country and over a number of years the chapter would get to know the professional HPs in that country, their culture, and their regulations, and how best to support them in their work.

Although still in its formative stage, RSWB nonetheless has gotten valuable information in spite of the small number of missions. Patient overexposures indicate the need for training to use and maintain healing arts radiation equipment; and with little information available on radioactive waste disposal, the need exists for attention to waste handling procedures.

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