

Preface

Publication of a series of papers dealing with Seismic Source Characterization in Switzerland and adjacent areas

There are two reasons for publishing a collection of papers dealing with Seismic Source Characterization in this volume of the Swiss Journal of Geosciences (SJG):

First, and from a purely scientific point of view, we find it appropriate to publish the main results of parts of the work performed on Seismic Source Characterization in Switzerland and adjacent areas in the framework of a larger study referred to as PEGASOS (Probabilistische Erdbeben-Gefährdungs-Analyse für Kernkraftwerk-Standorte in der Schweiz).

The results, presented by a series of papers, are an integral part of a larger unpublished study in applied geosciences and engineering aiming to update the seismic hazard assessments for the Swiss nuclear power plants (NAGRA 2004; to be obtained on request from swissnuclear by writing to info@swissnuclear.ch). Covering Seismic Source Characterization in Switzerland and adjacent areas, these papers are of considerable interest to a wider geoscience community in- and outside Switzerland. They provide an up-to-date account of aspects of neotectonics, seismotectonics and seismology in a continental area that is characterized by a diffuse plate boundary, associated with widely scattered epicenters and comparatively low rates of tectonic activity.

Secondly, the authors of this series of papers intend to dedicate their work to the memory of Martin Burkhard who died in 2006, i.e. two years after completion of work in the framework of PEGASOS. Martin was a member of one of four teams dealing with the characterisation of seismic sources.

All colleagues involved in this joint study will miss his warm personality, his keen intellect and great enthusiasm for geosciences. Note that Martin Burkhard also acts as an author of one of the papers presented here by his co-author. This is made possible by the fact that the PEGASOS study terminated before his tragic death.

The PEGASOS hazard analysis involved four main tasks, which were attributed to four separate sub-projects: (1) the definition of seismic sources, which is the topic of the scientific articles presented here, (2) the characterisation of ground motion attenuation, (3) the evaluation of site response, and, (4) the performance of seismic hazard calculations.

During a Probabilistic Seismic Hazard Analysis according to the rules set out by SSHAC (Senior Seismic Hazard Analysis Committee who advised the US authorities) the expert teams, during their work, were asked to represent a wider informed scientific community rather than just their own personal view. This led to the decision by the managing authority of the PEGASOS study to ask four teams to work in parallel, each one consisting of three scientists. This managing authority, namely Nagra (the National Co-operative for the Disposal of Radioactive Waste) was entrusted by swissnuclear to plan, organise and perform such a study, after the Swiss Federal Nuclear Safety Inspectorate (HSK) identified the need to update the seismic hazard assessments for the Swiss NPPs. Of course, the teams were encouraged to interact but they did not need to come to common conclusions. Rather, they provided their own input regarding source characterization, input that was used with equal weight during the main goal of the PEGASOS study, namely the calculation of earthquake-induced ground motion hazards and their uncertainty at the four sites of the Swiss nuclear power plants. As a result of this, the four expert groups made four largely independent assessments.

A brief overview of the PEGOAS study, including background and general methodology used, is found in a first paper written by Kevin Coppersmith, Robert Youngs and Christian Sprecher. These authors, who took a leading role in the PEGASOS project, also provide an overview of the main results of the part of the PEGASOS study that deals with source characterization.

The four papers that follow the introduction by Coppersmith et al. present selected aspects of the seismic source characterization performed by the four teams involved with source characterization. By publishing these four summaries, partly based on different concepts and/or methodologies and therefore complementary, SJG hopes to stimulate the scientific debate regarding ongoing tectonic activity as inferred from geological and seismotectonic approaches, and how this can be combined with information on regional seismicity to create a quantitative model of seismogenesis for use in hazard studies. Note that some of the authors included some references that post-date the year 2004 when the PEGASOS study came

to completion. In spite of this, the scientific content of the articles published in SJG remained unchanged in respect to the original study; the essential results of such later published work were already available to the experts in 2004, albeit in unpublished form.

In the name of SJG, we would like to thank Nagra, swiss-nuclear and HSK for permission to publish parts of the PEGASOS study. Above all, we greatly appreciate the effort

made by the authors of the papers presented in this volume of SJG. Finally we also thank the reviewers who helped to improve clarity and style of presentation of the contributions presented here.

Neuchâtel and Basel, March 2009

Stefan Bucher (Editor of SJG) and
Stefan Schmid (Associate Editor of SJG)