FOREWORD

Current global reference frames such as the International Terrestrial Reference Frames (ITRF) are the result of a combination of space geodetic technique measurements. This combination fully relies on the knowledge of the relative positions (or local tie vectors) between space geodetic instrument reference points on ground at co-location sites where several instruments are operating. These vectors are usually determined by standard surveying methods using topometry, levelling and Global Navigation Satellite System (GNSS) observations. In order to determine coordinates at the millimeter level with these methods, many cautions and an adequate methodology need to be followed by field surveyors and data analysists.

This document aims at summarizing the IGN best practice to perform local tie survey measurements and to process and archive associated data and results. Indeed, IGN surveyors have been involved in local tie measurements at many multi-technique co-location sites during the last two decades. In charge of performing local tie surveys at DORIS stations since the nineties, IGN benefited from NASA experience thanks to joint surveys at Hartebeesthoek and Sheshan in 2003. Since that time, nine other specific surveys involving more than 3 different technique instruments have been carried out in addition to other DORIS/GNSS co-located sites.

This document was initially written for IGN internal use but has been reorganized to be available to any person or group who wishes to learn from our experience in surveying multi-technique sites.