NCS 03-010 Delft, 31 March 2002

Draft ANNUAL REPORT 2002

Objective

The Nederlandse Commissie voor Stralingsdosimetrie (NCS, Netherlands Commission on Radiation Dosimetry) was established on 3 September 1982 with the main objective of promoting the appropriate use of radiation dosimetry, both for radiation research as for practical applications. The NCS is chaired by a board of scientists, installed in consultation with the supporting societies:

- Nederlandse Vereniging voor Radiotherapie en Oncologie (NVRO, Netherlands Society for Radiotherapy and Oncology);
- Nederlandse Vereniging voor Nucleaire Geneeskunde (NVNG, Netherlands Society for Nuclear Medicine);
- Nederlandse Vereniging voor Klinische Fysica (NVKF, Netherlands Society for Clinical Physics);
- Nederlandse Vereniging voor Radiobiologie (NVRB, Netherlands Society for Radiobiology);
- Nederlandse Vereniging voor Stralingshygiëne (NVS, Netherlands Society for Radiological Protection);
- Nederlandse Vereniging van Radiologisch Laboranten (NVRL, Netherlands Society of Radiographers and Radiological Technologists);
- Nederlandse Vereniging voor Radiologie (NVvR, Netherlands Society for Radiology);
- Société Belge des Physiciens des Hôpitaux/Belgische Vereniging voor Ziekenhuisfysici (SBPH/BVZF, Belgian Hospital Physicists Association).

To pursue its aims, the NCS has the following tasks:

- participation in dosimetry standardization and promotion of dosimetry intercomparisons;
- drafting of dosimetry protocols;
- collection and evaluation of physical data related to radiation dosimetry;
- maintain or establish links with national and international organizations concerned with ionizing radiation;
- promulgate information on new developments in the field of radiation dosimetry.

The Commission established a website: http://www.ncs-dos.org/

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Dept. Temperature and Radiation
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Tel. +31 30 253 9098, Fax. +31 30 253 9095
Website: http://www.ncs-dos.org/
E-mail: WdeVries@NMi.nl

Board

On December 31, 2002 the members of the board of the NCS were:

Prof.dr. S. Vynckier, chairman	(SBPH/BVZF)
Dr. B.J.M. Heijmen, vice chaiman	(NVRO)
Ir. W. de Vries, secretary	(NMi)
Dr. J. Zoetelief, treasurer	(NVRB)
Dr. A.J.J. Bos	(NVS)
Prof.dr. A.A. Lammertsma	(NVNG)
Drs. A. van Dalen	(NVvR)
Dr.ir. F.W. Wittkämper	(NVKF)
Mr. D. Zweers	(NVRL)

The board of the NCS met three times in 2002, on 18 February, 22 April and 28 October. The main subjects raised at the board meetings were:

- monitoring the progress of activities by subcommittees;
- initiate the publication of NCS-reports;
- the development of new activities;
- the organization of the fourth NCS Lustrum Symposium in November 2002;

No NCS-reports were published in 2002.

Subcommittees

1. Subcommittee "Uniformity of Dosimetry Protocols"

The subcommittee 'Uniformiteit Dosimetrieprotocollen' has held three meetings in 2002, namely on January 15th, April 16th, and September 19th.

The goals of the subcommittee are:

- To achieve uniformity of dosimetry protocols, based on absorbed dose to water.
- To publish a self-contained new Code of Practice (CoP).
- To draft a CoP that is concise, clear, and easy to use in practice.
- To draft a CoP that applies to ionization chambers and beam qualities that are being used in the Netherlands and Belgium.
- To give recommendations for Dutch and Belgian clinical physicists in the final report and in the CoP.

In 2002 the subcommittee made a selection of nine radiotherapy institutes and four types of chambers for her measurement program. This measurement program involves the experimental determination of k_Q beam quality correction factors for high-energy photon beams in selected clinical beams for selected types of ionization chambers using the NMi water calorimeter. These k_Q factors will become part of the new CoP.

All manufacturers that were approached (PTW, NE, and Wellhöfer) have lend up to six of each ionization chamber type for the time of the measurements. The nine selected radiotherapy institutes cover a representative range of clinical accelerator types and beam energies used in the Netherlands and in Belgium.

As part of the clinical program of the NMi, a test of the performance of the water calorimeter was carried out in February 2002 at the French national standards institute BNM-LNHB using their Saturne 43 accelerator at 6, 12, and 20 MeV. Measurements were hindered by the pick-

up of noise from the RF-generator of the accelerator. Replacing the lock-in amplifiers of the electronic detection circuit by high-accuracy digital multimeters solved this problem. Measurements at BNM-LNHB were repeated in August 2002 for a set of 5 NE2611A chambers, yielding an accurate reference set of k_Q-values.

In 2002, preliminary measurements were carried out at three radiotherapy institutes (NKI, Amsterdam, Hôpital de Jolimont, Haine-St-Paul and St. Joseph, Liège). These preliminary measurements consisted of determining the correction factors for polarity and recombination for the four chamber types, and determining the correction factor for the glass detection cell of the NMi water calorimeter.

The actual measurement of k_Q factors in the nine radiotherapy institutes will take place in 2003, starting in March 2003. On the average, one institute will be visited per month. Measurements are planned to be completed by December 2003.

Members of the subcommittee are:
Drs. A.H.L. Aalbers (chairman)
Mrs. M-T. Hoornaert
Dr. A. Minken
Dr. M.W.H. Pieksma (secretary)
Dr. H. Palmans
Prof. Dr. S. Vynckier
Dr. F.W. Wittkämper

2. Subcommittee "Dose Calculations in Megavoltage Photon Beams"

The aim of the Task Group is to publish recommendations for the methods of dose calculations in megavoltage photon beam therapy. The Task group assembled only once in the year 2002.

The attention of the group is focused on the set-up of an accurate monitor unit calculation method for asymmetrical fields, with or without a wedge or additional shielding blocks. An algorithm has been formulated. In 2002 measurements on different types of treatment machines and for photon energies ranging from ^{60}Co to 25 MV to test the algorithm have been finished. The data has been analyzed on its behavior with respect to the asymmetry of the beam.

The group has discussed whether and how to go on with this project. It is decided to present the different sets of date in one or two papers. Based on that and information from the literature a code of practice will be formulated.

Members of the subcommittee are:
Dr. J.J.M. van Gasteren (chairman)
Dr. S. Heukelom
Ir. H.N. Jager
Dr. R. van der Laarse
Dr. B.J. Mijnheer
Ir. J.P.C. van Santvoort
Dr. M. Tomsej
Dr.ir. J.L.M. Venselaar
Drs. J. Welleweerd

3. Subcommittee "Dosimetry in Radiology"

The subcommittee on dosimetry in radiology prepared an almost complete draft report by the end of 2000. As indicated in the 2001 NCS annual report, a complication occurred due to a draft ICRU Report entitled “Patient Dosimetry for X-Rays Used for Medical Imaging”. In the ICRU draft Report new symbols are proposed for quantities commonly used in patient dosimetry in radiology. The ICRU draft report has been discussed during a meeting of the ICRU main Commission. Most of the points of discussion will be dealt with soon. In addition, ICRU and IAEA recommendations will be co-ordinated, as discussed for a joint presentation in Vienna. As agreed in 2001 between the NCS chairman and the ICRU chairman, the NCS report and the ICRU Report will be published approximately simultaneously, most likely in 2003.

Membership of the subcommittee:
Dr. J. Zoetelief (chairman)
Dr. J. Geleijns (secretary)
Prof. Dr. J.J. Broerse
Dr. P.J.H. Kicken
Mr. W. Teeuwisse
Ir. W. de Vries
Mr. D. Zweers

4. Subcommittee "Treatment planning systems"

In 1996 the NCS installed the task group Treatment Planning Systems in order to produce a report with guidelines for the quality assurance (QA) of 3-D treatment planning systems (TPS). Early 2000 most chapters of this report had been written and the existing material was made available as a pre-release on the website of the NCS (*www.ncs-dos.org*) in March 2000.
In the course of 2000 and 2001 a number of colleagues sent comments after reading the material and some also gave feedback after applying the report in practice. This information was used to improve the report and also missing chapters were written. Work in progress in other task groups on QA of TPS, however, prompted a revision of the contents of the report. In order to be complementary a very practical report with more specific test descriptions was required, therefore a re-editing process was started in 2001. Due to many other activities of the chairman only limited progress was made during 2002; the task group now aims at a final version before July 2003.

<u>publications:</u>
I.A.D. Bruinvis. Quality assurance of 3-D treatment planning systems: the NCS Task Group Report. Klinische Fysica 2002/2+3, p.37-40

Members of the subcommittee are:
Dr. I.A.D. Bruinvis (chairman)
Drs. R.B. Keus
Drs. W.J.M. Lenglet
Drs. G.J. Meijer
Dr. B.J. Mijnheer
Dr. A.A. van ’t Veld
Dr.ir. J.L.M. Venselaar
Drs. J. Welleweerd
Ir. E. Woudstra

5. Subcommittee 'Electronic Personal Dosemeters'

The subcommittee 'Electronic Personal Dosemeters' (EPD) met six times during 2002. The present status of the EPD has been evaluated on basis of data found in the literature. Most important findings are:

- Most types of the studied EPDs meet, with some exceptions, the standards but they show a large variation in their dosimetric performance.
- A wide majority of EPDs are designed to measure only strongly penetrating radiation in terms of $H_P(10)$. Only few EPDs are designed to measure $H_P(0,07)$ i.e. are suitable for measuring beta radiation.
- Only very few EPDs are able to measure photons in the low energy range of 20 keV – 60 keV as met in hospital environments.

A draft report became available.

A presentation, based on the work of the task group, was given by A.J.J. Bos on 'Electronic Personal Dosemeters, state of the art', on the lustrum Symposium of the NCS at Delft, 15 November 2002.

The subcommittee hopes to present a final report in 2003.

Members of the subcommittee are:
Dr. A.J.J. Bos (chairman)
Mr. D. Zweers (secretary)
Dr. J.W.E. van Dijk
Dr. J. Geleijns
Ir. W. de Vries

6. Subcommittee 'Quality control of sealed betasources used in medicine'

Members of the subcommittee are:
Ir. W.J.F. Dries (chairman)
Drs. A.H.L. Aalbers
Ir. H.J. van Kleffens
Ir. R.P. Kollaard
Dr.ir. J. van der Marel
J.P.A. Marijnissen
M. Piessens
Dr. ir. D.R. Schaart
H. de Vroome

Advisory platforms

Advisory platforms 'radiology and nuclear medicine' and 'radiotherapy'

The platform radiology and nuclear medicine has met twice in 2002. The platform acts as a sounding board (for) the next projects:

- Demonstration project patient dosimetry
- Quality tests department of radiology
- IMS

The demonstration project patient dosimetry is going to be finished off on April 15, 2004. The project contained a training of x-ray lab assistants to perform dosimetry in day-to-day practice and to set-up comparisons with other hospitals. The project looks at techniques and expositions of more than 40 clinical indications for x-ray examinations. Preliminary results of the project have been talked about in an international working group by RIVM.

The platform has expressed its willingness to formulate reference doses and to guide projects for the promotion of quality, as mentioned in the Besluit Stralingsbescherming Kernenergiewet. The enthusiasm with which the platform was raised in 1999 has been dampened a little, thanks to the lack of willingness of the ministry of VWS to finance the projects in real. In the meantime, also internationally, the radiation load, especially with intervention radiology and CT has much attention. It is therefore obvious that new projects will be started in the coming year. The project 'constancy tests of x-ray machines' that aims at development of simple protocols makes good progress, for this project also count that the progress is being limited because the support, which was asked for by the ministry of VWS, has not been granted yet. The composition of this working group: W. Hummel (chair), M. Thijssen, L. van den Berg, T. Roding, J. Geleijns.

Membership advisory platform 'Radiology and Nuclear Medicine':

Leden:
Prof. Dr. J.J.Broerse
Dr. J.A.K.Blokland
Mr. F.Felderhof (has withdrawn as a member, the NVRL appoints a successor)
Dr. J.Geleijns (secretary)
Mrs. N. de Haan (has been succeeded by Mrs. I. van Helvoort)
Dr. Ir. P.J.H.Kicken
Ir. A.H.J.Renders
Mr. W.Termorshuizen
Drs. J.G.van Unnik (chairman)

Membership advisory platform 'Radiotherapy':

Prof.dr. J.J. Broerse (chairman)
Ir. W. de Vries (secretary)
Drs. E.N.J. van Lin
Mrs. F. Cavelaars
Dr. R.W. de Boer
Ir. C.F. Westermann

NCS FINANCIAL OVERVIEW 2002

	Income (NLG)	***Costs*** (NLG)

NCS FINANCIAL OVERVIEW 2002
(all amounts in Euro)

	Income €	***Costs*** €
Savings-account on December 31, 2001	7563.09	
Current-account on December 31, 2001	4547.99	
Checks and cash on December 31, 2001	233.24	
Contribution Netherlands Society for Radiology 2002	453.78	
Contribution Netherlands Society for Clinical Physics 2002	0	
Contribution Netherlands Society for Radiotherapy and Oncology 2002	700.00	
Contribution Netherlands Society for Nuclear Medicine 2002	90.75	
Contribution Netherlands Society for Radiological Protection 2002	102.10	
Contribution Netherlands Society for Radiobiology 2002	75.00	
Contribution Netherlands Society for Radiographers and Radiological Technologists 2002	113.45	
Belgian Hospital Physicists Association 2002	0	
Interest savings-account	188.60	
Sales of NCS Reports	300.23	
Balance from lustre symposium in 2002	2524.18	
Farewell present Johan Broerse		138.45
Costs Chamber of Commerce		35.01
Banking costs		28.86
Banking costs Belgian account		4.64
Costs of board and subcommittees meetings		243.54
Costs web site		388.77
Non-cashable cheques		203.74
Cheques and cash on December 31, 2002		60.00
Savings-account on December 31, 2002		7751.69
Current-account on December 31, 2002		7442.75
Belgian current-account on December 31, 2002		594.96
Total	16892.41	16892.41

NCS BUDGET 2003
(all amounts in Euro)

	Income €	***Costs*** €
Contributions scientific societies	1600.00	
Interest savings-account	200.00	
Sales of NCS Reports	300.00	
Contributions from others to printing costs of NCS Reports	1500.00	
Costs Chamber of Commerce		35.00
Banking costs		30.00
Costs of board and subcommittees meetings		235.00
Costs web site		400.00
Costs of printing NCS Reports		2900.00
Total	3600.00	3600.00

NCS FOURTH LUSTRE SYMPOSIUM 2002
(all amounts in Euro)

	Income	***Costs***
	€	€
Contributions from participants	5290.00	
Design web site and folder		360.00
Printing of folder		525.42
Reimbursement travel costs		50.40
Klinische Fysica		1250.00
Dinner for speakers and NCS board		580.00
Total	5290.00	2765.82
PM costs of equipment and lunch at Aula Congress Centre		2863.75
Total including costs paid in 2003		5629.57

NB In 2002 a balance of € 2524.18 resulted

NB In total a deficit of € 339.57 (planned was a deficit of € 1000)