

# RADIATION DOSIMETRY ACTIVITIES IN THE NETHERLANDS

## INVENTORY COMPILED UNDER THE AUSPICES OF THE NETHERLANDS COMMISSION FOR RADIATION DOSIMETRY

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## 1. INTRODUCTION

The Netherlands Commission for Radiation Dosimetry (NCS) was officially established on 3 September 1982 with the aim of promoting the appropriate use of dosimetry of ionizing radiation both for scientific research and practical applications. The foundation is chaired by a scientific council installed upon the suggestion of the supporting societies including the Group of Radiation Physicists, the Netherlands Society for Clinical Physics, the Netherlands Society for Nuclear Medicine, the Netherlands Society for Radiobiology, the Netherlands Society for Radiotherapy, the Netherlands Society for Radiation Hygiene and the Institute of Public Health and Environmental Hygiene. To pursue its aims the Netherlands Commission for Radiation Dosimetry has initiated a number of activities among others collection and evaluation of physical data for dosimetry in radiotherapy, X-ray diagnosis and nuclear medicine, drafting of dosimetry protocols, participation in dosimetry standardisation and promotion of dosimetry intercomparisons.

The present report provides a compilation of the dosimetry activities and expertise available in the Netherlands, based on the replies to a questionnaire mailed under the auspices of the NCS and might suffer from some incompleteness in specific details. The addresses of the Dutch groups with the names of the scientists are given in section 2. Individual scientists, not connected with a scientific group, hospital or organization have not been included in this list. Also the names of commercial firms producing dosimetric systems have been omitted.

The participants are grouped according to their principal interests in section 3.1, and to their main activities in section 3.2. The types of radiation employed by the different groups are summarized in section 3.3. and the dosimetry techniques available at the institute in section 3.4. The report ends with a reference list of communications published by the participating institutes on radiation dosimetry in the period 1978-1986.

It is expected that this report will intensify the contacts between the different Dutch institutes. Reprints of the papers mentioned in the reference list can be obtained from the individual scientists upon request. It is further anticipated that this report will have catalytic consequences for cooperation and will avoid unnecessary duplication of research on dosimetry of ionizing radiation. Further copies of this report are available at the NCS secretariat, P.O. Box 1, 3720 BA Bilthoven, The Netherlands.



## SECTION 2

### ADDRESSES OF DUTCH GROUPS WORKING ON RADIATION DOSIMETRY WITH NAMES OF SCIENTISTS IN PARENTHESES.

- AMC Academic Medical Centre, Dept. of Radiotherapy  
Meibergdreef 9, 1105 AZ Amsterdam, phone 020-5669111/4231  
(J.D.P. van Dijk)
- AZL Academic Hospital Leiden, Dept. of Clinical Oncology  
Building 1 KI-P  
Rijnsburgerweg 10, 2333 AA Leiden, phone 071-262914  
(H. de Vroome and J. Davelaar)
- BRO Bronovo Hospital Den Haag  
Bronovolaan 5, 2597 AX Den Haag, phone 070-124081  
(K.S. Wiarda)
- BVI Institute for Radiotherapy and Nuclear Medicine, Bernard  
Verbeeten Institute  
P.O. Box 90120, 5000 LA Tilburg, phone 013-655725  
(P.H. van der Giessen and J. Venselaar)
- DSM DSM Central Laboratory, Dept. IDC  
P.O. Box 18, 6160 MD Geleen, phone 04494-66023  
(D. Bossus, L.G.F.M. Stroeken and J.P.H.M. Severens)
- ECN ECN-Gezondheidsbeschermingsdienst  
P.O. Box 1, 1755 ZG Petten, phone 02246-4226  
(J. Stoute and W.L. Zijp)
- GAK Gemeentelijk Administratie Kantoor, afd. Bedrijfsveiligheid  
P.O. Box 8300, 1005 CA Amsterdam, phone 020-879111  
(B.J. Sponselee)
- HOV Hoechst Holland NV  
P.O. Box 65, 4380 AB Vlissingen, phone 01196-82252  
(J.W. Edel)
- IRI Interuniversitair Reactor Instituut  
Mekelweg 15, 2629 JB Delft, phone 015-781036/786617  
(A.J.J. Bos, C.E. Rasmussen and L.H. Luthjens)
- KLU Koninklijke Luchtmacht, afd. WO/DMKLu  
Binckhorstlaan 135, 2516 BA Den Haag, phone 070-492099  
(J.L. Baak and P. Mourik)

- 5 -

- KUND Catholic University Nijmegen, Radboud Hospital, Dept. of Radiodiagnostics  
Geert Grooteplein Zuid 18, 6525 GA Nijmegen, phone 080-517164/514545  
(M.A.O. Thijssen)
- KUNH Catholic University Nijmegen, Dept. Health Physics  
Toernooiveld 1, 6525 ED Nijmegen, phone 080-558833 ext. 2165  
(L.B. Beentjes)
- KUNN Catholic University Nijmegen, Radboud Hospital, Dept. of Nuclear Medicine  
Prof. v. Ginnikenstraat 8, 6524 RD Nijmegen, phone 080-221286  
(W. Buijs)
- KUNR Catholic University Nijmegen, Radboud Hospital, Dept. of Radiotherapy  
Geert Grooteplein Zuid 18, 6525 GA Nijmegen, phone 080-516825  
(W.F.M. Brouwer, and J.M. van Gasteren)
- MAL Mallinckrodt Diagnostica  
P.O. Box 3, 1755 ZG Petten, phone 02246-7054/7012  
(J.G. van der Baan)
- MBL Medisch Biologisch Laboratorium TNO  
P.O. Box 45, 2280 AA Rijswijk, phone 015-138777  
(P.H.M. Lohman, G.P. van der Schans and L. Roza)
- NIK Nationaal Instituut voor Kernenergie en Hoge-energie Fysica  
P.O. Box 4395, 1009 AJ Amsterdam, phone 020-5922068  
(P.W.F. Louwrier, C.J. Post and G.A. Brinkman)
- NKIN Netherlands Cancer Institute, Dept. of Nuclear Medicine  
Plesmanlaan 121, 1066 CX Amsterdam, phone 020-5122305  
(H.R. Marcuse and J. van der Steen)
- NKIR Netherlands Cancer Institute, Dept. of Radiotherapy  
Plesmanlaan 121, 1066 CX Amsterdam, phone 020-5122127  
(B.J. Mijnheer, H. Meertens and I.A.D. Bruinvis)
- OCD Oncological Center IJsselstreek Deventer  
H.J.P. Fesevurstraat 11, 7415 CM Deventer, phone 05700-22333  
(A. van 't Riet)
- ORG Organon International BV  
P.O. Box 20, 5340 BH Oss, phone 04120-62784  
(J. Wallaart)

- PHI Nederlandse Philips Bedrijven  
Past. Petersstraat 10-15, Eindhoven, phone 040-755115  
(J. Rosendaal and H. Pauw)
- RBI Radiobiological Institute TNO  
P.O. Box 5815, 2280 HV Rijswijk, phone 015-136940, ext. 453  
J.J. Broerse, L.A. Hennen, B. Hogeweg and J. Zoetelief)
- RDA Radiological Service TNO  
P.O. Box 9034, 6800 ES Arnhem, phone 085-569333  
(H.W. Julius and J.G. Ackers)
- RIF Radiotherapeutic Institute Friesland  
Borniastraat 4a, 8934 AD Leeuwarden, phone 058-131317  
(S.J. Feenstra and P. Inia)
- RIVM National Institute of Public Health and Environmental Hygiene  
Laboratorium voor Stralingsonderzoek  
P.O. Box 1, 3720 BA Bilthoven, phone 030-742935  
(A.H.L. Aalbers, K.H. Chadwick, R. van Dongen and H.P. Leenhouts)
- RRTI Rotterdam Radiotherapeutic Institute, Dept. of Physics  
Groene Hilledijk 301, 3075 EA Rotterdam, phone 010-391480  
(A.G. Visser, J.A. van de Poel, H.J. van Kleffens,  
W.M. Star and E. Woudstra)
- RUGN Rijksuniversiteit Groningen, Dept. of Nuclear Medicine,  
University Hospital  
P.O. Box 3001, 9700 RB Groningen, phone 050-613541  
(H. Beekhuis)
- RUGR Rijksuniversiteit Groningen, Dept. of Radiotherapy,  
University Hospital  
P.O. Box 3001, 9700 RB Groningen, phone 050-613674  
(H.H. Kruize and J.H. Welleweerd)
- RUGS Rijksuniversiteit Groningen, Dept. of Safety  
P.O. Box 1102, 9701 BC Groningen, phone 050-635550  
(H. Hekman and G.J. Schutten)
- RULH Rijksuniversiteit Leiden, Dept. of Safety  
Boerhaavelaan 176, 2334 EV Leiden, phone 071-148333 ext.  
5000  
(J. van der Eijnde)
- SHR Shell Ned. Raffinaderijen BV  
P.O. Box 7000, 3000 KA Rotterdam, phone 010-313383  
(B. Roberti)



- SOP Sophia Ziekenhuis  
Dr. van Heesweg 2, 8025 AB Zwolle, phone 038-977444  
(Th. van Deursen)
- THE Technical University Eindhoven, Radiation Protection Service  
P.O. Box 513, 5600 MB Eindhoven, phone 040-473355  
(Chr.J. Huyskens, P. Kicken and J. Hemelaar)
- WEZ Westeinde Hospital  
P.O. Box 432, 2501 CK Den Haag, phone 070-889393  
(C.F. Westermann)
- ZLE Hospital Leyenburg, Dept. of Radiotherapy/Medical Physics  
Leyweg 275, 2545 CH Den Haag, phone 070-298000  
(P.C. van der Pol, L.S. Jonker and J.H. Berkman)

## SECTION 3. COMPILATION OF DOSIMETRY ACTIVITIES

## 3.1 PRINCIPAL APPLICATION

	Environmental	Personnel	Diagnostic (external)	Diagnostic (internal)	Therapy (external)	Therapy (internal)	Reactor	High Dose	Heat	Light
AMC					0	0			0	
AZL					0	0				
BRO				0				0		
BVI		0		0	0	0				
DSM	0							0		
ECN	0	0								
CAK	0	0								0
HOV		0								
IRI		0					0	0		
KLU	0	0						0		
KUND		0	0							
KUNH	0	0	0	0						
KUNN		0		0		0				
KUNR		0			0	0				
MAL		0								
MBL		0								0
NIK	0	0						0		
NKIN				0		0				
NKIR					0	0				
OCD					0	0				
ORG		0								
PHI		0								
RBI	0	0	0	0	0					0
RDA	0	0	0		0					
RIF					0	0				
RIVM	0		0	0	0	0		0		
RRTI		0	0	0	0	0			0	0
RUGN		0		0		0				
RUGS		0	0		0					
RUGT		0			0					
RULH		0								
SHR		0								
SOP					0	0				
THE	0	0								
WEZ		0		0	0	0				
ZLE					0					

3.2 MAIN AREA OF ACTIVITIES

	Modelling	Microdosimetry (research)	Macrodosimetry (research)	Detector development	Special applications	Routine applications
AMC				0	0	
AZL			0			
BRO						
BVI						
DSM						
ECN	0				0	0
GAK				0		0
HOV					0	0
IRI						
KLU			0	0		0
KUND					0	
KUNH	0		0			
KUNN	0		0			
KUNR	0		0			
MAL						
MBL		0				
NIK	0		0	0	0	
NKIN		0				
NKIR	0		0		0	
OCD						
ORG						
PHI						
RBI	0	0	0	0	0	
RDA	0		0	0	0	
RIF						
RIVM	0	0	0	0	0	
RRTI	0					
RUGN			0			
RUGS					0	
RUGT						
RULH						
SHR					0	
SOP					0	
THE			0	0		
WEZ	0		0	0	0	
ZLE						



3.3 TYPES OF RADIATION EMPLOYED

	$\alpha$	$\beta$	Fast electrons	$\gamma/X$	Neutrons	Mesons	Microwaves	Ultraviolet
AMC			0	0				
AZL		0		0			0	
BRO			0	0				
BVI			0	0	0			
DSM	0	0		0				
ECN	0	0		0	0			
GAK	0	0		0	0			
HOV	0	0		0			0	
IRI	0	0	0	0				
KLU	0	0		0	0			0
KUND				0	0			0
KUNH	0	0		0	0			0
KUNN		0		0	0			0
KUNR			0	0	0			
MAL		0		0	0			
MBL				0	0			
NIK				0	0			0
NKIN	0	0		0	0	0		
NKIR			0	0	0			
OCD			0	0	0			
ORG		0		0	0			
PHI				0	0			
RBI	0	0		0	0			
RDA				0	0			0
RIF			0	0	0			
RIVM	0	0		0	0			
RRTI			0	0				
RUGN		0		0	0			
RUGS			0	0	0			
RUGT			0	0	0			
RULH		0		0				
SHR		0		0				
SOP			0	0				
THE		0		0	0			
WEZ	0	0	0	0				
ZLE			0	0				0

## 3.4 DOSIMETRY TECHNIQUES

## Ionization chambers

	General	Nuclear Enterprises	Physikalisch Technische Werkstätte	Victoreen	Nardeux	Far West Technology	Exradin	LND	Capintec
AMC		0	0						
AZL	0	0	0						
BRO	0								
BVI		0		0					
DSM									
ECN	0				0	0		0	
GAK									
HOV									
IRI	0	0	0		0				
KLU									
KUND									0
KUNH		0							
KUNN									
KUNR		0	0						
MAL									
MBL									
NIK	0								
NKIN									
NKIR	0	0	0				0		
OCD		0	0						
ORG									
PHI									
RBI	0	0	0			0	0		
RDA	0		0	0					0
RIF			0						
RIVM	0	0	0						
RRTI		0	0						
RUGN	0		0						
RUGS		0	0						
RUGT	0								
RULH	0								
SHR									
SOP	0								
THE	0								
WEZ	0	0	0						
ZLE		0							

## 3.4 DOSIMETRY TECHNIQUES

	TLD					GM - proportional counters	Scintillation detectors	Chemical dosimetry	Semiconductors
	General	Therados	MBLE	Harshaw					
AMC				0		0	0		0
AZL				0		0	0		0
BRO				0					
BVI				0			0		0
DSM				0					
ECN				0		0	0		0
GAK				0		0	0		0
HOV				0		0	0		0
IRI	0			0		0	0	0	0
KLU				0		0	0		0
KUND				0		0			0
KUNH				0		0	0		0
KUNN						0	0		0
KUNR		0				0			0
MAL			0						
MBL						0		0	
NIK									
NKIN							0		
NKIR				0		0			0
OCD						0	0		0
ORG							0		
PHI				0		0			
RBI				0		0			
RDA	0			0		0	0		0
RIF				0		0			
RIVM	0			0		0	0		0
RRTI	0						0	0	0
RUGN	0					0	0		
RUCS				0					
RUGT	0					0			
RULH									
SHR						0	0		
SOP									
THE				0		0	0		
WEZ						0			0
ZLE						0	0	0	0

3.4 DOSIMETRY TECHNIQUES

	Track detectors	Photographic film	Calorimetry	Activation and fission detectors	Neutron rem counters	Thermometry	Bolometry
AMC						0	
AZL		0					
BRO							
BVI							
DSM							
ECN	0	0			0		
GAK						0	
HOV							
IRI				0	0		
KLU		0					
KUND		0					
KUNH					0		
KUNN							
KUNR		0					
MAL		0					
MBL							0
NIK				0			
NKIN		0					
NKIR		0		0	0		
OCD		0					
ORG							
PHI							
RBI				0	0		
RDA		0					
RIF							
RIVM			0		0		
RRTI		0					
RUGN							
RUGS							
RUGT							
RULH							
SHR		0					
SOP							
THE		0					
WEZ		0			0		
ZLE							

## Dosimetry publications AZL

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Technique and dosimetry of total body irradiation at Leiden.  
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4. Passchier, W.F.  
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6. Passchier, W.F.  
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2. Beentjes, L.B., Scholte, P.J.L., Wielen, A.W. van der, Kal, H.B.  
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4. Bont, A.H., Beentjes, L.B.  
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5. Beentjes, L.B., Wielen, A.W. van der, Kal, H.B.  
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6. Beentjes, L.B., Broerse, J.J., Kogel, A.J. van der,  
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The induction of UV-type damage by  $^{60}\text{Co}$   $\gamma$ -rays in human fibroblasts. In: Proc. Int. Congress. Rad. Res. (eds. J.J. Broerse, G.W. Barendsen, H.B. Kal, A.J. van der Kogel) Martinus Nijhoff Publ. Amsterdam (1983) B2-34.
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