



**Standards**  
**Human DNA Analysis and Interpretation**  
**(001.1 - 001.3)**

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## **Part I. General Introduction to Standards**

### **§ 1. Background to and aim of the Standards**

Reporting forensic experts play a crucial role in the administration of justice. The NRGD aims to ensure justified confidence in forensic expertise for stakeholders. This confidence must be based on the demonstrable independently safeguarded quality of forensic investigators and their reports on the basis of (inter)national forensic-specific standards.

The NRGD is managed by the Board of Court Experts (hereinafter: Board). The Board has the legal duty to manage a public register of forensic experts who do comply with the Board's registration requirements. The registration requirements have been laid down in concordance with the field of expertise and have been demarcated in specific Standards per field of expertise. This is important in order to inform applicants, assessors and users of the register (e.g. judge, public prosecutor and attorney) about the activities an expert in the field of expertise in question engages in and about the activities that fall outside the field of expertise. The demarcation of the field of expertise is set out in Part II of these Standards.

The Board also determines the criteria on the basis of which an assessment is made for each field of expertise as to whether an application complies with the quality requirements. The generic requirements are set out in the Register of Court Experts in Criminal Cases Decree (Besluit register deskundige in strafzaken). These requirements are elaborated further for each field of expertise. This elaboration is set out in Part III of these Standards.

Furthermore the Board determines the assessment procedure. This procedure is described in Part IV of these Standards.

The NRGD has a system of periodic repeat registration. Court experts must demonstrate every five years that they still meet the requirements in force at that time. The Standards are dynamic and are being developed further in order to enhance the quality of the experts. These Standards set out the current state of the (sub-)field of expertise.

### **§ 2. Types of applications**

The NRGD distinguishes two types of applications: the application for initial registration and the application for reregistration. The application for initial registration is submitted by an expert who at the time of submission of the application is not yet registered in the register for the field of expertise to which the application relates. The application for reregistration is submitted by an expert who is already registered in the register for the field of expertise to which the application relates.

These two types of applications are subdivided as follows:

Application for initial registration:

- (i) independent expert: an expert who has independently written and signed the required number of case reports;
- (ii) expert without work of his own: an expert who has not independently written and signed the number of case reports required for registration.

*If the assessment is favourable, the expert without work of his own will only qualify for provisional registration.*

Application for reregistration:

- (i) after full registration;
- (ii) after provisional registration.

The application for initial registration is submitted by an expert who at the time of submission of the application does not have an NRGD registration. This might be:

- the independently reporting expert;
- the newly trained expert;
- the expert whose earlier application has been rejected by the Board;
- the expert whose registration was previously stricken.

In respect of applications for initial registration, it is necessary to make a clear distinction between the independent expert and the expert without work of his own. An example of an expert without work of his own is the newly trained expert. This expert has completed the forensic training (training on drawing up forensic reports), but has not yet been able to independently write the number of reports required for the assessment because these are written under the supervision of a tutor during the training. Another example of an expert without work of his own is the expert whose earlier application was rejected and who has been working (partly) under supervision following this rejection.

The Board adopts the following principle. Every applicant must draw up a List of Case Information. This list must include a specific number of cases in a period specified by the Board immediately preceding the application. If the List of Case Information includes one or more cases which have been prepared under supervision, the applicant will be qualified as an 'expert without work of his own'. Additional requirements apply to the applicant whose application was rejected earlier: the case reports must have been drawn up after the date of the Board's decision rejecting the earlier application (Policy Framework for Application after Rejection).

The distinction between the various types of applications for reregistration is important in the context of the assessment procedure, e.g. the documents a expert must submit, the composition of the Advisory Committee for Assessment and the assessment method.

### **§ 3. Justification of Standards**

The draft of these Standards has been published on the NRGD website for public consultation. These Standards have been established by the Board in accordance with the Register of Court Experts in Criminal Cases Decree (Besluit register deskundige in strafzaken).

### **§ 4. Validity of Standards**

The Standards are valid from the date shown on the cover. The validity runs until the moment of publication of a new version. In principle it will be checked annually as being up-to-date. This check can lead to a new version. The aim is to publish the new version no more than once a year. Intermediate alterations can be incorporated in an addendum, which will be published on the NRGD website as well.

### **§ 5. Version management and formal revision history**

All changes made to the Standards lead to a new version. Newer versions of (parts of) the Standards are designated with a higher version number.

### **5.1. Version management**

In the case of editorial changes the version number is increased by 0.1. Editorial changes have no substantive impact. In the case of substantive changes the version number is increased by 1.

### **5.2. Formal revision history**

The revision history starts with version 1.0 as the first formally approved version. Substantive changes made are briefly described in the revision history (Annex C). This makes it possible to trace which Standards are valid at any given moment at all times.

## Part II. Demarcation of 'Human DNA Analysis and Interpretation'

### § 1. Introduction

Within the field of expertise 'Human DNA analysis and interpretation', the following questions are relevant. These questions follow the generally acknowledged 'hierarchy of propositions' (Cook et al. 1998) explaining among others the sub source, source and activity levels in forensic reasoning.

#### *1. From whom does the biological trace originate i.e. who is the donor of the cellular material?*

For the court this question concerns individualisation. This question can be addressed under propositions formulated at the so called sub source level. This requires knowledge of and experience with DNA profiling and statistical evaluation, including knowledge of the legal status and working procedures concerning national DNA databases for criminal cases, among which, criteria for inclusion and removal of DNA profiles, criteria for matching, and inclusion of and comparison with partial DNA profiles and mixed DNA profiles.

By including kinship analysis in this first question, it can be rewritten as:

#### *Is there a biological relationship between the donor of the biological trace and the donor of the reference material?*

This question is applicable for kinship analysis where, for example, the DNA of relatives leads to the individualization of an unknown perpetrator. Furthermore, kinship analysis can be used to determine parental lineage. Kinship analysis is a separate specialist discipline and requires the use of sophisticated software tools due to the increasing complexities the comparison of these DNA profiles comprises.

#### *2. Are biological traces present on the exhibit and what is the body fluid origin of the cellular material in the biological trace?*

What type of cellular material is present in a trace (e.g. blood, semen, saliva, vaginal epithelial cells etc.) and can we attribute it to a specific donor of DNA in that trace? This is a typical source level issue.

To answer these questions we address the findings given propositions at source level. This requires knowledge and experience of both presumptive and confirmatory testing and other laboratory tests e.g. staining of sperm cells and visual aspects, concerning identification and classification.

#### *3. How or when was the biological material deposited?*

Activity level questions address aspects of how and when trace DNA or a body fluid might have been transferred. Are there scenarios on questioned activities or the timing of criminal activities in the case to which the findings of biological traces examinations may be assessed?

The findings are addressed under propositions at activity level. These propositions generally deal with questioned aspects of activities performed by individuals prior or during an incident. Addressing the findings given activity level propositions requires knowledge of issues of transfer, persistence, prevalence and background, and recovery of DNA, as well as of case information management and proper statistical modelling.

## § 2. Core activities

Within the field of expertise ‘Human DNA analysis and interpretation’ we recognize three subfields of expertise to answer the questions stated above. Those fields are outlined and delineated below:

- 001.1. DNA Source Level
- 001.2. DNA Kinship Analysis
- 001.3. DNA Activity Level

Note that different experts/laboratories apply different techniques and not all techniques are applied by each expert/laboratory. Experts are expected to be able to make general comments on the possibilities and limitations of all available techniques, and to have in-depth knowledge of the techniques in use by their respective laboratories.

### 2.1. DNA Source Level

There are many different tasks performed by Source Level DNA experts that require specific competences. Most experts are competent in only a couple of those tasks as it is nearly impossible for a single expert to be competent in all the tasks source level has to offer. Therefore, all the additional tasks DNA Source Level has to offer are covered by means of the Extended version. Each expert should be competent in all the tasks described in ‘2.1.1. DNA Source Level’ to qualify for DNA Source Level registration. If the expert is competent and performs any of the tasks in ‘2.1.2. DNA Source Level Extended’ then they should indicate this and they will be assessed on the tasks indicated by themselves.

#### 2.1.1. DNA Source Level

In a criminal law context, these types of analyses experts seek to help the court answer the question: *From whom does the biological trace originate? In other words, who is the donor of the DNA?*

The expert subjects biological trace material to autosomal DNA analysis, and will subsequently perform DNA profile comparison. To do this, the expert compares DNA profiles from trace material with each other and/or with DNA profiles from reference samples. In addition, comparisons may be made with DNA profiles in DNA databases.

The tasks that are covered by DNA Source Level analysis are:

- Autosomal DNA analysis and interpretation. This includes both high and low-template samples, single source and mixed DNA profiles.
- Probabilistic genotyping to calculate the weight of evidence. The expert is able to define appropriate propositions and apply a proper statistical model to the data. The expert should be able to defend the decisions made, and should be able to explain the workings of the model in general terms. The expert is not expected to be able to have access to, or to have knowledge on the workings of, the source code of the software used. This falls within the domain of a forensic statistician.
- The expert is able to report on the findings and express the limitations of the techniques that are applied. The expert interprets and compares individual and complex and/or mixed DNA profiles obtained from the trace material under standard conditions or with the help of low template/minimal traces DNA techniques.
- The expert is able to express limitations of their source level competency. Given the questions put to them by a mandating authority, they are able to determine when a formal probabilistic assessment of the evidence given activity level propositions is required.

- Translate examination strategy to the case. When questions are asked to the expert by a mandating authority, the expert should be able to explain the decisions made on relevant examinations.

### 2.1.2. DNA Source Level Extended

With the types of investigations described below experts seek to help the court answer the question: *Are biological traces present on the exhibit and what is the nature of the cellular material in the biological trace?*

The expert should indicate whether he/she is or isn't proficient in the tasks described below when applying for registration. Subsequently, the applicant will be assessed on the tasks he or she indicates; this can be one, some or all of the tasks listed below. Additionally, the expert should indicate whether he or she has been assessed on these tasks when reporting to the court of law. The expert is expected not to report beyond the limits of his/her expertise, as stipulated by the NRGD code of conduct<sup>1</sup>.

The additional tasks covered by an expert with extended knowledge and experience in DNA analysis and profile interpretation are:

- **Y-chromosomal DNA analysis** - The expert is able to apply and interpret findings from Y-chromosomal DNA analysis (e.g. YSTR, Y-SNP).
- **Mitochondrial DNA analysis** - The expert is able to apply and interpret findings from mitochondrial DNA analysis.
- **Examination Strategy** - The expert is able to formulate and execute an examination strategy based on the relevant question in the case. The expert is able to examine items of evidence, or have them examined and collect traces.
- **Cell Typing** - The expert is able subject traces to cell type testing using presumptive testing or other tests for bodily fluids or other cellular material. The expert is able to infer presence or absence of a specific cell type, given the known limitations of the tests that were applied. The expert is able to draw inferences on whether or not the cell type can be associated with a specific donor.

Note that probabilistic assessment, beyond standard LR calculations given source level propositions, of these associations (with uncertain cell type evidence and/or non-gender specific markers like saliva or blood) fall outside of the scope of this expertise. Such assessments require thorough understanding of Bayesian inference and as such fall within the activities of 'DNA Activity Level'.

## 2.2. DNA Kinship Analysis

In a criminal law context, experts in DNA Kinship Analysis contribute to answering questions addressing the potential biological relationship between individuals, living or deceased. Applications include among others familial searches in DNA databases and population screenings. As such, kinship analysis contributes to answering the question who the source of questioned (trace) materials is.

The expert interprets and compares DNA profiles obtained from trace materials and/or reference samples under standard conditions or with the help of low template/minimal traces DNA techniques.

The tasks that fall under DNA Kinship analysis:

<sup>1</sup> NRGD code of conduct: <https://wetten.overheid.nl/BWBR0037418/2016-01-01>



- Autosomal DNA analysis and interpretation. This includes both high and low-template samples, single source and mixed DNA profiles.
- Appropriate statistical calculations to assign the weight of evidence. The expert is able to set appropriate propositions and apply a proper statistical model to the data. The expert should be able to defend the decisions made, and should be able to explain the workings of the model in general terms. The expert is not expected to be able to have access to, or to have knowledge on the workings of, the source code of the software used. This falls within the domain of a forensic statistician.
- Analysis and/or interpretation of non-autosomal DNA marker sets for the use within kinship analysis. This includes STR or SNP analysis of autosomal, Y-chromosomal, X-chromosomal and mitochondrial DNA. (Note that not all techniques are applied by each expert/laboratory. Experts are expected to be able to make general comments on the possibilities and limitations of all available techniques and to have in-depth knowledge of the techniques in use by their respective laboratories).
- Statistical calculations given relevant familial relationships within the context of the case. This could be either a likelihood ratio or a posterior probability (e.g. in paternity/maternity cases if prior odds are disclosed). This includes the use of specialized kinship software.
- Report writing; the expert is able to write a report on the evaluation of kinship between donors of the DNA material, following generally accepted guidelines from professional bodies (e.g. ENFSI, ISFG).

### 2.3. DNA Activity Level

In a criminal law context, with Activity Level analysis experts seek to help the court answer the question: *How or when was the biological material deposited?*

Activity Level analysis involves the provision of a numerical and/or verbal strength of support for the probability of the evidence given the truth of two competing propositions formulated at the activity level.

The expert is able to formulate an examination strategy based on the relevant question in the case. The expert will examine, or will have items of evidence examined, traces that have been collected and subjected to cell type testing using presumptive testing or other tests for bodily fluids or other cellular material. Alternatively, the expert has past experience with these aspects and up-to-date knowledge of current processes and is able to draw inferences from analyses performed by other experts/laboratories. The expert is able to report on the findings and express the limitations of the techniques that are applied.

The expert interprets and compares individual and complex and/or mixed DNA profiles obtained from the trace material under standard conditions or with the help of low template/minimal traces DNA techniques. The expert's focus is on the whole scope of biological traces.

Experts concerned with activity level activities mainly focus on the following tasks:

- Autosomal and YSTR DNA interpretation. This includes both high and low-template samples, single source and mixed DNA profiles.
- Probabilistic genotyping to assess the weight of evidence. The expert is able to set appropriate propositions and apply a proper statistical model to the data. The expert should be able to defend the decisions made, and should be able to explain the workings of the model in general terms. The expert is not expected to be able to have access to, or to have knowledge on the workings of, the source code of the software used. This falls within the domain of a forensic statistician.
- Probabilistic assessment of associations with uncertain cell type evidence and/or non-gender specific markers like saliva or blood that require thorough understanding of Bayesian inference.

- Case assessment. The expert is able to discuss the relevant issue with the mandating authority and is able to structure case information in relevant propositions, assumptions and undisputed case information. The expert is able to communicate limitations, for example if no reasonable assessment is possible due to lack of information. The expert is able to translate a case assessment based on the case information into an examination strategy.
- Statistical modelling. The expert is able to set up a proper model, e.g. a Bayesian Network, to calculate a likelihood ratio based on probabilities of transfer, persistence, prevalence, background and recovery of biological materials given the relevant propositions and findings in the case. As part of this the expert is able to construct a Bayesian network if needed (e.g. with multiple findings that are conditionally dependent or when cell type attribution is at issue). The expert must be able to express the limitations of modelling decisions.
- Assigning probabilities. The expert is able to assign probabilities to the transfer, persistence, prevalence, background and recovery of biological materials given the propositions, assumptions and case information. Experts must be able to make the boundaries of their knowledge explicit. The source on which the assignment of probabilities is based should be transparent (e.g. expert elicitation, case file data, published studies, case specific experiments).
- The expert is able to write a report on the evaluation of the findings given activity level propositions following generally accepted guidelines from professional bodies (e.g. ENFSI<sup>2</sup>, ISFG<sup>3</sup>).

### § 3. Boundaries of the fields of expertise

There are specific areas of forensic genetics that fall outside the scope of the field 'Human DNA Analysis and Interpretation' as registered by the NRGD:

- *Ancestry*

Specific question: Determine the geographical origin of the unknown cell donor by means of STR or SNP DNA analysis of the trace evidence.

- *Externally Visible Characteristics*

Specific question: Determine externally visible characteristics (e.g. hair colour, eye colour, skin tone, etc.) of the unknown cell donor by means of DNA analysis of the trace evidence.

- *Searches in public DNA databases (genealogy)*

Specific question: Find individuals possibly related to the donor of the questioned biological material through genealogical analyses in public DNA databases (e.g. Gedmatch or others).

- *Proteome, metabolome and microbiome analyses*

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<sup>2</sup> Willis, S. M., McKenna, L., McDermott, S., O'Donnell, G., Barrett, A., Rasmusson, B., & Zadora, G. (2015). ENFSI guideline for evaluative reporting in forensic science. *European Network of Forensic Science Institutes*.

<sup>3</sup> Gill, P., Hicks, T., Butler, J. M., Connolly, E., Gusmão, L., Kokshoorn, B., & Schneider, P. M. (2020). DNA commission of the International society for forensic genetics: Assessing the value of forensic biological evidence-Guidelines highlighting the importance of propositions. Part II: Evaluation of biological traces considering activity level propositions. *Forensic Science International: Genetics*, 44, 102186.  
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These techniques are applied in the field of forensic genetics to address questions on cell type, as well as to generate 'intelligence' on habits or characteristics of individuals.

## § 4. Registration

### 4.1. The subfields further explained

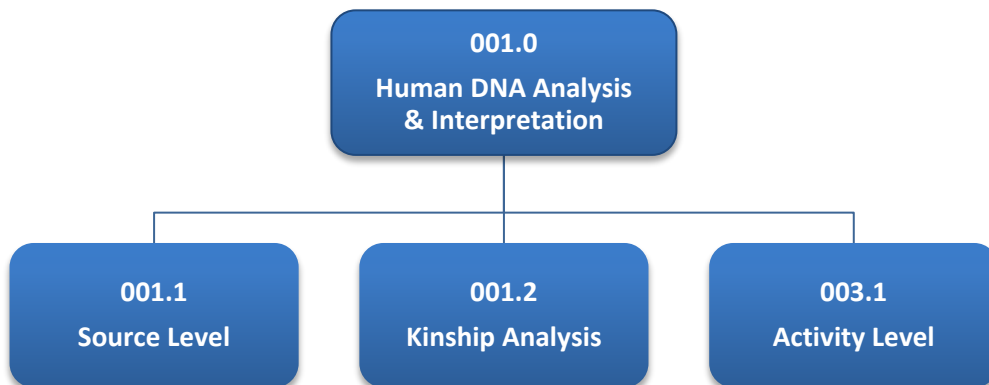
The register will list the name of the expert as an expert in the field of:

- 001.1 Human DNA analysis and interpretation - Source Level
- 001.2 Human DNA analysis and interpretation - Kinship Analysis
- 001.3 Human DNA analysis and interpretation - Activity Level

### 4.2. Defined subfields

Experts in the field of 'Human DNA Analysis and Interpretation' have a shared knowledge of DNA analysis and interpretation, which might be supplemented with knowledge of one or more activities.

The NRGD distinguishes three subfields within the field of 'Human DNA Analysis and Interpretation'. The expert must stipulate the subfield(s) from at least one of the categories below. In view of this, the expert will be assessed based on the registration requirements (Part III) and according to the assessment procedure (Part IV).



### 4.3. Transitional arrangement

From the day of effect of Standards version 4.0, the experts previously registered with NRGD in the field of DNA Analysis and Interpretation are considered competent at the new subfield of DNA Source Level and will remain registered as such up until their reregistration/expiration. DNA experts registered under a previous version of the Standards have a level of expertise similar to the tasks as described above under 2.1 including the extended tasks Y-Chromosomal DNA Analysis, Cell Typing and Examination Strategies.

### **Part III. Registration requirements for ‘Human DNA Analysis and Interpretation’**

The general (repeat) registration requirements are given in the next paragraphs in italics with a reference to Article 12 paragraph 2 in the Register of Court Experts in Criminal Cases Decree (Besluit register deskundige in strafzaken).

An expert will only be registered as an expert in criminal cases upon submission of the application if, in the opinion of the Board, the expert:

- a. has sufficient knowledge and experience in the field of expertise to which the application relates;
- b. has sufficient knowledge of and experience in the field of law concerned, and is sufficiently familiar with the position and the role of the expert in this field;
- c. is able to inform the commissioning party whether, and if so, to what extent the commissioning party’s question at issue is sufficiently clear and is capable of investigation in order to be able to answer it on the basis of their specific expertise;
- d. is able, on the basis of the question at issue, to prepare and carry out an investigation plan in accordance with the applicable standards;
- e. is able to collect, document, interpret and assess investigative materials and data in a forensic context in accordance with the applicable standards;
- f. is able to apply the current investigative methods in a forensic context in accordance with the applicable standards;
- g. is able to give, both orally and in writing, a verifiable and well-reasoned report on the assignment and any other relevant aspects of their expertise in terms which are comprehensible to the commissioning party;
- h. is able to complete an assignment within the stipulated or agreed period;
- i. is able to carry out the activities as an expert independently, impartially, conscientiously, competently, and in a trustworthy manner.

#### **§ 1. Article 12(2) sub-paragraph a**

*(...) has sufficient knowledge and experience in the field of expertise to which the application relates.*

To be registered in one of the subfields of expertise, the expert needs to meet the specific requirements for the applicable subfield of expertise, additionally to the basic requirements. All kinds of mentioned DNA profiles should be represented in the List of Case Information of which at least half of them should be mixed or complex DNA profiles.

#### **1.1. Application for initial registration: independent expert**

##### Basic requirements:

- work at the level of someone who has completed an academic Master’s Degree, and must have a proven level of education, training and expertise;
- be familiar with the summary of concepts (see annex A) and keep abreast of state-of-the-art developments;
- have sufficient knowledge of the pros and cons of various techniques, specialisations and scientific methods used in the field, be aware and capable of explaining the possibilities and limitations of these techniques, specialisations and methods, and keep abreast of related recent developments;

- have spent an average of 40 hours a year over the past 5 years on forensically relevant professional development (e.g. publications, attending conferences, running or attending courses).

#### Specific requirements Source Level:

- minimally be able to answer questions about Autosomal DNA Testing and Low Template/Minimal Traces DNA Testing;
- have interpreted and reported on at least 100 single source and/or complex and/or mixed DNA profiles divided over a minimum of 10 case requests in the past 5 years that have been subjected to collegial review;  
*In case the applicant is also acting as a supervisor, at least 60 complex and/or mixed DNA profiles should be independently interpreted and reported on.*

#### Specific requirements Kinship Analysis:

- minimally be able to answer questions about Autosomal DNA Testing and Low Template/Minimal Traces DNA Testing;
- have interpreted and reported on at least 50 kinship cases in the past 5 years that have been subjected to collegial review;  
*In case the applicant is also acting as a supervisor, at least 30 of the kinship cases should be independently interpreted and reported on.*

#### Specific requirements Activity Level:

- have interpreted and reported on Source Level on at least 25 single source and/or complex and/or mixed DNA profiles divided over a minimum of 5 case requests in the past 5 years that have been subjected to collegial review and/or supervision or be registered as a Source Level or Kinship Analysis expert;
- have interpreted and reported on at least 5 cases containing propositions on activity level in the past 5 years that have been subjected to collegial review;  
*In case the applicant is also acting as a supervisor, at least 3 cases containing propositions on activity level should be independently interpreted and reported on.*

### **1.2. Application for initial registration: expert without work of his own**

#### Basic requirements:

- work at the level of someone who has completed an academic Master's Degree, and must have a proven level of education, training and expertise;
- be familiar with the summary of concepts (see annex A) and keep abreast of state-of-the-art developments;
- have sufficient knowledge of the *pros* and *cons* of various techniques, specialisations and scientific methods used in the field, be aware and capable of explaining the possibilities and limitations of these techniques, specialisations and methods, and keep abreast of related recent developments;
- have spent an average of 40 hours a year over the past 2 years on forensically relevant professional development (e.g. publications, attending conferences, running or attending courses).

#### Specific requirements Source Level

- minimally be able to answer questions about Autosomal DNA Testing and Low Template/Minimal Traces DNA Testing;

- have interpreted and reported on at least 40 single source and/or complex and/or mixed DNA profiles divided over a minimum of 4 case requests in the past 2 years that have been subjected to collegial review and/or supervision.

#### Specific requirements Kinship Analysis

- minimally be able to answer questions about Autosomal DNA Testing and Low Template/Minimal Traces DNA Testing;
- have interpreted and reported on at least 20 kinship cases in the past 2 years that have been subjected to collegial review and/or supervision.

#### Specific requirements Activity Level:

- have interpreted and reported on Source Level on at least 10 single source and/or complex and/or mixed DNA profiles divided over a minimum of 2 case requests in the past 2 years that have been subjected to collegial review and/or supervision or be registered as a Source Level or Kinship Analysis expert;
- have interpreted and reported on at least 3 cases containing propositions on activity level in the past 2 years that have been subjected to collegial review and/or supervision.

### **1.3. Application for reregistration: after full registration**

#### Basic requirements:

- work at the level of someone who has completed an academic Master's Degree, and must have a proven level of education, training and expertise;
- be familiar with the summary of concepts (see annex A) and keep abreast of state-of-the-art developments;
- have sufficient knowledge of the *pros* and *cons* of various techniques, specialisations and scientific methods used in the field, be aware and capable of explaining the possibilities and limitations of these techniques, specialisations and methods, and keep abreast of related recent developments;
- have spent an average of 40 hours a year over the past 5 years on forensically relevant professional development (e.g. publications, attending conferences, running or attending courses).

#### Specific requirements Source Level:

- minimally be able to answer questions about Autosomal DNA Testing and Low Template/Minimal Traces DNA Testing;
- have interpreted and reported on at least 50 single source and/or complex and/or mixed DNA profiles divided over a minimum of 5 case requests in the past 5 years that have been subjected to collegial review;

*In case the applicant is also acting as a supervisor, at least 30 complex and/or mixed DNA profiles should be independently interpreted and reported on.*

#### Specific requirements Kinship Analysis:

- minimally be able to answer questions about Autosomal DNA Testing and Low Template/Minimal Traces DNA Testing;
- have interpreted and reported on at least 25 kinship cases in the past 5 years that have been subjected to collegial review;

*In case the applicant is also acting as a supervisor, at least 15 kinship cases should be independently interpreted and reported on.*

Specific requirements Activity Level:

- have interpreted and reported on Source Level on at least 10 single source and/or complex and/or mixed DNA profiles divided over a minimum of 2 case requests in the past 5 years that have been subjected to collegial review or be registered as a Source Level or Kinship Analysis expert;
- have interpreted and reported on at least 3 cases containing propositions on activity level in the past 5 years that have been subjected to collegial review;  
*In case the applicant is also acting as a supervisor, at least 2 case(s) containing propositions on activity level should be independently interpreted and reported on.*

**1.4. Application for reregistration: after provisional registration**Basic requirements:

- work at the level of someone who has completed an academic Master's Degree, and must have a proven level of education, training and expertise;
- be familiar with the summary of concepts (see annex A) and keep abreast of state-of-the-art developments;
- have sufficient knowledge of the *pros* and *cons* of various techniques, specialisations and scientific methods used in the field, be aware and capable of explaining the possibilities and limitations of these techniques, specialisations and methods, and keep abreast of related recent developments;
- have spent an average of 40 hours a year during the registration period on forensically relevant professional development (e.g. publications, attending conferences, running or attending courses).

Specific requirements Source Level:

- minimally be able to answer questions about Autosomal DNA Testing and Low Template/Minimal Traces DNA Testing;
- have interpreted and reported on at least 40 single source and/or complex and/or mixed DNA profiles divided over a minimum of 4 case requests in the past 2 years that have been subjected to collegial review.  
*In case the applicant is also acting as a supervisor, at least 24 complex and/or mixed DNA profiles should be independently interpreted and reported on.*

Specific requirements Kinship Analysis:

- minimally be able to answer questions about Autosomal DNA Testing and Low Template/Minimal Traces DNA Testing;
- have interpreted and reported on at least 20 kinship cases in the past 2 years that have been subjected to collegial review.  
*In case the applicant is also acting as a supervisor, at least 12 complex and/or mixed DNA profiles on the List of Case Information should be independently interpreted and reported on.*

Specific requirements Activity Level:

- have interpreted and reported on Source Level on at least 10 single source and/or complex and/or mixed DNA profiles divided over a minimum of 2 case requests in the past 2 years that have been subjected to collegial review or be registered as a Source Level or Kinship Analysis expert;
- have interpreted and reported on at least 3 cases containing propositions on activity level during the registration period that have been subjected to collegial review.

*In case the applicant is also acting as a supervisor, at least 2 complex and/or mixed DNA profiles should be independently interpreted and reported on.*

**1.5. Application after rejection or after legally expired application**

In accordance with the policy framework 'Application after Rejection', registration requirements listed above under *Application for Initial Registration* apply for experts whose registration has been rejected by the Board in an application procedure or for experts whose registration has legally expired within the previous two years. Exclusively reports written after the date of the rejection will be assessed. Additionally, reports of supervision and/or collegial review will be included in the assessment (see also Part IV).



**§ 2. Article 12(2) sub-paragraph b**

*(...) has sufficient knowledge of and experience in the field of law concerned, and is sufficiently familiar with the position and the role of the expert in this field.*

- In general an applicant should have adequate knowledge of Dutch criminal law:
  - context of criminal law:
    - Trias Politica;
    - distinction between civil law, administrative law and criminal law.
  - criminal law procedure:
    - pre-trial investigation;
    - coercive measures;
    - stages of the proceedings;
    - actors in the criminal justice system (tasks/powers/responsibilities);
    - regulations concerning experts laid down in the Dutch Code of Criminal Procedure (position and powers of commissioning party, legal position of expert, position and powers of lawyer, forms of counter-analysis, register of experts in the context of criminal law);
    - legal decision-making framework of the court in criminal cases (decision-making schedule laid down in Section 350 of the Dutch Criminal Code of Procedure), also with a view to the relevance of the commission to the expert and to the question at issue;
    - course of the criminal trial;
    - position of the expert in the court procedure.
  - substantive criminal law:
    - sanctions and grounds for exemption from criminal liability (very basic).
  - knowledge of the legal context of safeguarding the quality of the expert and the analysis/investigation:
    - position and role of the co-operating organisations in the criminal justice system in safeguarding the quality of the reports;
    - professional codes and relevant regulations in relation to the NRGD Code of Conduct.
- In addition to the above requirements, an applicant for the field of expertise Human DNA Analysis and Interpretation should be familiar with the specific Dutch DNA legislation, and keep abreast of new legislation.

**§ 3. Article 12(2) sub-paragraph c**

*(...) is able to inform the commissioning party whether, and if so, to what extent the commissioning party's question at issue is sufficiently clear and capable of investigation in order to be able to answer it on the basis of their specific expertise.*

**§ 4. Article 12(2) sub-paragraph d, e and f**

*d. is able, on the basis of the question at issue, to prepare and carry out an investigation plan in accordance with the applicable standards.*

*e. is able to collect, document, interpret and assess investigative materials and data in a forensic context in accordance with the applicable standards.*

For DNA Activity Level:

- Is able to identify the issue(s) in the case
- Is able to set appropriate propositions based on the issue(s) in the case
- Is able to determine an appropriate examination strategy based on the issue(s) and propositions
- Assumptions and limitations of the examination are stated in the report

*f. is able to apply the current investigative methods in a forensic context in accordance with the applicable standards.*

For DNA Source Level and Kinship Analysis an applicant is required to:

- have insight and experience regarding (forensic) DNA statistics, including:
  - background information, minimally:
    - knowledge of DNA database search controversy;
    - knowledge of both Prosecution and Defence Fallacies;
    - knowledge of the false positive fallacy (knowledge about how to account for the possibilities of errors when reporting a likelihood ratio or match probability);<sup>4</sup>
  - population genetics;
  - propositions and their hierarchy;
  - Bayesian and frequentist statistics;
  - knowledge of the terms listed in Annex A;
  - statistical calculations used to assign the evidential value of a match;
- be able to define which DNA analyses are to be used and how. An applicant must be able to record, assess and interpret the results. An applicant must have a thorough knowledge of all methods and be able to explain them; must have knowledge of state-of-the-art developments in autosomal and low template/minimal traces DNA Testing methods;
- be aware of the possibilities and limitations of Y-chromosomal Testing methods, Kinship DNA Testing, Mitochondrial DNA Testing, Externally Visible Characteristics and Activity level reporting;
- be aware of the *pros* and *cons* of various techniques, specialisations and scientific methods used in the field, be aware of and able to explain the possibilities and limitations of these techniques, specialisations and methods, be aware of the potential for international searches of intelligence databases and follow up on developments thereof.

For DNA Activity Level an applicant is required to:

- be aware and have sufficient knowledge of the investigative methods and interpretation of Source Level analyses;
- be able to use a logically correct framework to interpret the results;
- be able to identify all relevant variables and dependencies to interpret the results;
- be able to determine probabilities for the relevant variables using relevant sources of data;
- when using a Bayesian network for the interpretations, be able to correctly construct a Bayesian Network, enter correct information into the Bayesian Network and evaluate the Bayesian Network;
- be able to draw a logically correct conclusion from the interpretation;
- know the limitations of evaluation given activity level propositions in a given case (e.g., lack of data, lack of case information, results too complex).

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<sup>4</sup> Thompson, W.C., Taroni, F. & Aitken, C.G.G. (2003). How the Probability of a False Positive Affects the Value of DNA Evidence. In: *Journal of Forensic Sciences* 48(1), 47-54.

**§ 5. Article 12(2) sub-paragraph g**

*(...) is able to give, both orally and in writing, a verifiable and well-reasoned report on the assignment and any other relevant aspects of their expertise in terms which are comprehensible to the commissioning party.*

An applicant is required to:

- be able, on the basis of the results, to report comprehensively to laymen on an interpretation and conclusion (orally and in writing) and to substantiate the results statistically where relevant;

For DNA Activity Level an applicant is required to:

- to add to the report, if available, a pre-assessment, context information, assumptions and limitations, (explanation of the) methodology, value of the results given the alleged activities, meaning of the likelihood ratio and explaining the construction of the used Bayesian Network;
- explain their reasoning based on a transparent (source of the data) and intelligible manner (plain language, explanation of terminology if needed);
- is required to give the value of their results given the propositions, not the value of the propositions given the results.

**§ 6. Article 12(2) sub-paragraph h**

*(...) is able to complete an assignment within the stipulated or agreed period.*

**§ 7. Article 12(2) sub-paragraph i**

*(...) is able to carry out the activities as an expert independently, impartially, conscientiously, competently, and in a trustworthy manner.*

An applicant should:

- comply with the NRGD Code of Conduct determined by the Court Experts Board and published on the website of the NRGD.

**§ 8. Hardship clause**

The Board may decide not to apply or deviate from a registration requirement if application of such requirement would produce very unreasonable results. The hardship clause may only offer a solution in certain exceptional situations. It is up to the applicant himself to submit facts and circumstances showing that a certain registration requirement is unreasonable in his specific case.

## **Part IV. Assessment procedure for ‘Human DNA Analysis and Interpretation’**

### **§ 1. General**

In all fields of expertise the assessment will be based on the written information provided, including as a minimum requirement case reports and items of evidence, supplemented in principle with an oral assessment. However, such an oral assessment will not be necessary if the applicant's expertise has already been clearly demonstrated by the written information.

The assessment will in principle be carried out on the basis of the information provided by the applicant:

- general information as part of the application package
- documentary evidence of competence.

If it is felt necessary in the context of the assessment an additional case report and/or information, for example information about the way collegial review and/or supervision is organized within the organization, can be requested.

### **§ 2. Assessment procedure per type of application**

#### **2.1. Application for initial registration: independent expert**

##### Documents to be submitted:

- NRGD application form;
- Certificate of Good Conduct (not older than 3 months);
- a clearly legible copy of a valid passport or identity card;
- copies of documents relating to the highest level of professional qualification;
- a curriculum vitae (CV), preferably in English;
- documentary evidence of the current academic working level, and proof of being an expert authorised to sign (if applicable);
- Overview Continuing Professional Development DNA;
- list of Case Information DNA;
- 3 case reports drawn up in the past 5 years selected by the applicant from the List of Case Information DNA. For each subfield, the applicant should have at least 2 case reports, when applying for multiple subfields. In case of applying for DNA Source Level Extended, at least one of the submitted reports should contain the execution of the specific task(s) listed in 2.1.2. When several subfields are combined in one case report, it is possible to provide the same case report for different subfields (001.1 – 001.3). The case reports must contain the report itself and peak profiles for DNA Source Level and Kinship Analysis. If possible, the case reports should also contain the testimony delivered in court;
- if the applicant uses Bayesian Networks in their Activity Level interpretations then they should include the Bayesian networks and all additional information in the application.

*These case reports should provide a clear and broad picture of the applicant's competencies. Subsequently, only independently written reports should be submitted.*

- If available:
  - proof of the forms of professional development referred to in the Overview Continuing Professional Development Human DNA analysis and interpretation;

- a statement concerning the level of accreditation of the applicant's working environment, where applicable.

Assessment method:

phase a. administrative, by the NRGD Bureau;

phase b. substantive, by an Advisory Committee for Assessment (ACA) made up of at least three people on the basis of the available written material, including possible supplementary written information. In principle this ACA consists of a lawyer and two professional assessors;

phase c. substantive, by the same ACA by means of an oral assessment. This oral assessment will be waived if the applicant's expertise has already been clearly established in phase b;

phase d. decision by the Board: registration, provisional registration or no registration.

**2.2. Application for initial registration: expert without work of his own**

Documents to be submitted:

- NRGD application form;
- Certificate of Good Conduct (not older than 3 months);
- a clearly legible copy of a valid passport or identity card;
- copies of documents relating to the highest level of professional qualification;
- a curriculum vitae (CV), preferably in English;
- documentary evidence of the current academic working level, and proof of being an expert authorised to sign (if applicable);
- Overview Continuing Professional Development DNA;
- list of Case Information DNA;
- 3 case reports drawn up in the past 2 years selected by the applicant from the List of Case Information DNA. For each subfield, the applicant should have at least 2 case reports, when applying for multiple subfields. In case of applying for DNA Source Level Extended, at least one of the submitted reports should contain the execution of the specific task(s) listed in 2.1.2. When several subfields are combined in one case report, it is possible to provide the same case report for different subfields (001.1 – 001.3). The case reports must contain the report itself and peak profiles for DNA Source Level and Kinship Analysis. If possible, the case reports should also contain the testimony delivered in court;
- if the applicant uses Bayesian Networks in their Activity Level interpretations then they should include the Bayesian networks and all additional information in the application.

*These case reports should provide a clear and broad picture of the applicant's competencies.*

- If available:
  - proof of the forms of professional development referred to in the Overview Continuing Professional Development Human DNA analysis and interpretation;
  - a statement concerning the level of accreditation of the applicant's working environment, where applicable.

Assessment method:

phase a. administrative, by the NRGD Bureau;

phase b. substantive, by an Advisory Committee for Assessment (ACA) made up of at least three people on the basis of the available written material, including possible supplementary written information. In principle this ACA consists of a lawyer and two professional assessors;

- phase c. substantive, by the same ACA by means of an oral assessment. This oral assessment will be waived if the applicant's expertise has already been clearly established in phase b;
- phase d. decision by the Board: provisional registration or no registration.

### **2.3. Application for reregistration: after full registration**

#### Documents to be submitted:

- NRGD application form;
- Certificate of Good Conduct (not older than 3 months);
- copies of documents relating to the highest level of professional qualification (if changed);
- an updated curriculum vitae (CV), preferably in English;
- Overview Continuing Professional Development DNA;
- list of Case Information DNA;
- 2 case reports drawn up in the past 5 years selected by the applicant from the List of Case Information DNA. For each subfield, the applicant should have at least 2 case reports, when applying for multiple subfields. In case of applying for DNA Source Level Extended, at least one of the submitted reports should contain the execution of the specific task(s) listed in 2.1.2. When several subfields are combined in one case report, it is possible to provide the same case report for different subfields (001.1 – 001.3). The case reports must contain the report itself and peak profiles for DNA Source Level and Kinship Analysis. If possible, the case reports should also contain the testimony delivered in court;
- if the applicant uses Bayesian Networks in their Activity Level interpretations then they should include the Bayesian networks and all additional information in the application.

*These case reports should provide a clear and broad picture of the applicant's competencies. Subsequently, only independently written reports should be submitted.*

- If available:
  - proof of the forms of professional development referred to in the Overview Continuing Professional Development Human DNA analysis and interpretation;
  - a statement concerning the level of accreditation of the applicant's working environment, where applicable.

#### Assessment method:

- phase a. administrative, by the NRGD Bureau;
- phase b. substantive, by an Advisory Committee for Assessment (ACA) made up of at least two people on the basis of the available written material. This ACA will in principle consist of a lawyer and a professional assessor;
- phase c. substantive, by the same ACA to which one professional assessor is added, drawn from the same field of expertise as the applicant, on the basis of the available written material. This will not be necessary if the ACA unanimously gives a positive recommendation to the Board in phase b;
- phase d. substantive, by the ACA specified at phase c by means of an oral assessment. This oral assessment will be waived if the applicant's expertise has been clearly established in phase c;
- phase e. decision by the Board: registration, provisional registration or no registration.

### **2.4. Application for reregistration: after provisional registration**

#### Documents to be submitted:

- NRGD application form;

- an updated curriculum vitae (CV), preferably in English;
- copies of documents relating to the highest level of professional qualification (if changed);
- Overview Continuing Professional Development DNA;
- list of Case Information DNA;
- 2 case reports drawn up in the past 2 years selected by the applicant from the List of Case Information DNA. For each subfield, the applicant should have at least 2 case reports, when applying for multiple subfields. In case of applying for DNA Source Level Extended, at least one of the submitted reports should contain the execution of the specific task(s) listed in 2.1.2. When several subfields are combined in one case report, it is possible to provide the same case report for different subfields (001.1 – 001.3). The case reports must contain the report itself and peak profiles for DNA Source Level and Kinship Analysis. possible, the case reports should also contain the testimony delivered in court;
- if the applicant uses Bayesian Networks in their Activity Level interpretations then they should include the Bayesian networks and all additional information in the application.

*These case reports should provide a clear and broad picture of the applicant's competencies. Subsequently, only independently written reports should be submitted.*

- If available:
  - proof of the forms of professional development referred to in the Overview Continuing Professional Development Human DNA analysis and interpretation;
  - a statement concerning the level of accreditation of the applicant's working environment, where applicable.

#### Assessment method:

phase a. administrative, by the NRGD Bureau;

phase b. substantive, by an Advisory Committee for Assessment (ACA) made up of at least three people on the basis of the available written material. In principle this ACA consists of a lawyer and two professional assessors;

phase c. substantive, by the same ACA by means of an oral assessment. This oral assessment will be waived if the applicant's expertise has already been clearly established;

phase d. decision by the Board: registration, provisional registration or no registration.

### **2.5. Application after rejection or after legally expired registration (fast-track)**

#### Documents to be submitted:

- NRGD application form;
- an updated curriculum vitae (CV), preferably in English;
- documentary evidence of the current academic working level, and proof of being an expert authorised to sign (if applicable);
- Overview Continuing Professional Development DNA;
- list of Case Information DNA, exclusively listing reports written after the date of rejection by the Board or the date of the legal expiration;
- 3 case reports drawn up after the date of rejection by the Court Experts Board or the date of legal expiration, selected by the applicant from the List of Case Information. In case of applying for DNA Source Level Extended, at least one of the submitted reports should contain the execution of the specific task(s) listed in 2.1.2. For each subfield, the applicant should have at least 2 case reports, when applying for multiple subfields. When several subfields are combined in one case report, it is possible to provide the same case report for different subfields (001.1 – 001.3). The case reports must contain the report itself and peak profiles for DNA Source Level and Kinship Analysis. If possible, the case reports should also contain the testimony delivered in court;

- all reports of supervision and/or collegial review related to the submitted case reports;
- if the applicant uses Bayesian Networks in their Activity Level interpretations then they should include the Bayesian networks and all additional information in the application.

Assessment method:

- phase a. administrative, by the NRGD Bureau;
- phase b. substantive, by an Advisory Committee for Assessment (ACA) made up of at least three people on the basis of the available written material, including possible supplementary written information. In principle this ACA consists of a lawyer and two professional assessors;
- phase c. substantive, by the same ACA to which one professional assessor is added, drawn from the same field of expertise as the applicant, on the basis of the available written material. This will not be necessary if the ACA unanimously gives a positive recommendation to the Board in phase b;
- phase d. substantive, by the ACA specified at phase c by means of an oral assessment. This oral assessment will be waived if the applicant's expertise has been clearly established in phase c;
- phase e. decision by the Board: provisional registration or no registration.



## **Annex A Summary of concepts Human DNA Analysis and Interpretation**

This document contains keywords for concepts of which an expert in the field of *DNA* should minimally have a basic knowledge.

### **Keywords**

#### Forensic biology

Sources of DNA evidence

Crime scene investigation and laboratory analysis of biological evidence

Identification and presumptive testing of body fluids (blood, semen, saliva)

Confirmatory assays for body fluid identification (immunoassays)

Uncertainty concerning attribution of DNA (particularly at low levels) to specific body fluids

#### General

The structure of DNA and the variability of the human DNA genome

Loci, alleles, genotypes and DNA profiles

Polymorphisms commonly used for DNA testing

The molecular biological basis of forensic DNA tests; using the DNA profile to identify a forensic sample

Extraction and quantification of DNA

Polymerase chain reaction

Short tandem repeats and mutation processes

Forensic multiplex STR typing kits

DNA separation by CE and LIF detection

Analysis of results, including the use of ladders for fragment sizing, use of analytical thresholds and identification of artefacts such as stutter, “pull-up” and identification of mixed samples.

#### QC/QA

Quality control and quality assurance of forensic DNA analysis

Laboratory accreditation, personnel certification and proficiency testing

Validation studies

Laboratory error rates

Understanding and minimizing the risk of contamination in the forensic process: methods of reducing the occurrence of contamination and detecting when it has occurred

Continuous improvement and quality

#### DNA statistics

Likelihood Ratio (LR)

Bayes Theorem

Product rule to calculate the probability of independent variables

DNA mixture deconvolution and recommended procedures for analysing mixed samples

Accounting for relatives, where applicable, in calculating evidential strength

#### Database issues

Inclusion criteria and search (im)possibilities of the national DNA database including the detection of false negative and false positive matches.

Population Genetics

Hardy-Weinberg equilibrium/Linkage equilibrium

### Population Substructure

Allele frequencies, genotype probabilities

Applying the product rule for independent events

Conditional match probabilities

Fst/Theta population substructure correction; correction for possible allele dropout

Sampling variation in construction of DNA population databases

### Proper Interpretation of the Evidence

Common Logical Fallacies (Prosecution/Defence Fallacy)

Evidential strength of database match

DNA database search controversy

Avoidance of cognitive bias

### Minimal traces (Low Template DNA Analysis)

Evaluation of potential low template DNA typing results.

Allele and/or locus dropout due to degradation, preferential amplification, stochastic effects and stochastic thresholds.

Replication and consensus DNA profiles

Approaches for the statistical evaluation of DNA profiles from low template DNA samples

### Y-chromosome Testing

Y-chromosome evolution and its consequences for forensic analyses

Patrilineal inheritance

Laboratory analysis of Y-chromosome STR's

Population genetics of Y-STR haplotypes

Use of Y-STR population databases (YHRD)

Statistical evaluation of Y-chromosome haplotypes

Interpretation of Y-STR mixtures

### Kinship DNA Testing

Inheritance of genetic polymorphisms

Technical procedures for determining kinship

Statistical evaluation of kinship (e.g. paternity index, sibling index, Bayesian networks)

Incorporation of the presence of mutations and null-alleles in the statistical evaluation

Principles of disaster/mass identification

Principles of familial searching in databases

Use of Y-STR and mtDNA analysis to narrow candidate lists from familial searching in databases

### Externally Visible Characteristics

Evolution and migration of Homo sapiens

Population genetics of externally visible characteristics

Principles of determining the geographic origin of an individual

Principles of determining externally visible characteristics

Knowledge about genes involved in the biosynthesis of melanine (skin and hair pigmentation, iris colour)

Technical procedures for determining geographic origin or externally visible characteristics

Approaches for the interpretation of genotyping results for determining geographic origin or externally visible characteristics

Knowledge of the limitations of determining geographic origins or externally visible characteristics

Mitochondrial DNA Testing

Mitochondrial DNA evolution and its consequences for forensic analysis

Matrilineal inheritance, variable mutation rates, heteroplasmy and principles for evaluating close non-matching mtDNA sequences

Laboratory analysis of mitochondrial DNA (e.g. Sanger sequencing, mini-sequencing)

Population genetics of mitochondrial DNA haplotypes

Use of mitochondrial DNA databases (EMPOP)

Statistical evaluation of mitochondrial DNA matches

Reporting at Activity level

Understanding of the principles of case assessment and interpretation (CAI)<sup>5</sup> and the necessity for the following criteria: balance, logic, robustness and transparency

Formulation and evaluation of appropriate hypotheses

Understanding use of data and experience for evaluation of results given activity level hypotheses:

- Knowledge concerning transfer of cells and DNA (primary, secondary, tertiary)
- Knowledge concerning persistence of DNA and the impact of e.g. environmental conditions
- Extensive experience of forensic DNA analysis and interpretation in forensic casework
- Transparency regarding any limitations of the data used

Understanding of the principles of probabilistic (Bayesian) networks in evidence interpretation

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<sup>5</sup> R. Cook, I.W. Evett, G. Jackson, P.J. Jones, J.A. Lambert - *Science and Justice*, 1998 38(3): 151–156.

## Annex B NRGD Glossary

Advisory Committee for Assessment	A committee appointed by the Board which advises the Board on the (repeat) applicant's (degree of) suitability for (repeat) registration.
Applicant	Natural person submitting an application to the NRGD in order to be (re)registered in the register.
Application for initial registration	An expert who submits an application to be entered in the register and does not or not yet have an NRGD registration at the time when the application is made.
Application for reregistration	An application submitted by an expert who at the time of submitting the next application already has a NRGD registration, possibly for a provisional registration.
Assessor	A member of an Advisory Committee for Assessment.
Board	The Court Experts Board is the body as referred to in Section 51k(2) of the Code of Criminal Procedure and is charged with managing the register.
Brdis	Register of Court Experts in Criminal Cases Decree (Besluit register deskundige in strafzaken).
Bureau	The NRGD Bureau that supports the Board.
Collegial review	The assessment of another person's work for the purpose of continuous quality control of a person's expertise. There is thereby not a hierarchical but a horizontal relationship between colleagues specialised in the same subject area. The reviewer does not sign the report.
Continuing professional development	All (training) activities that contribute to the ongoing development of knowledge and skills, which is desirable and necessary in order to be able to continue performing the role of court expert in a professional manner.
Expert	An individual who issues a report for the administration of justice and/or gives testimony in court.
Expert without work of his own	An expert who has not independently completed and signed the number of case reports required for registration.
Forensic training on reporting	A coherent and structured arrangement of organised training activities in which the necessary knowledge and experience are acquired to report as a court expert in criminal law proceedings and that is completed by an exam.

Independent expert	An expert who has independently prepared and signed the required number of case reports
Intervision	A structured (interdisciplinary) meeting between people who are working or training in the same professional area, not being an operations meeting. The subject of discussion is in any case the forensic work carried out and the associated problems. The aim is to enhance the expertise of those involved and improve quality of work. Unlike supervision, there is no hierarchical relationship between the participants.
NRGD	The Netherlands Register of Court Experts of which the Board and the Bureau form part.
Provisional registration	The registration of an expert for a period specified by the Board and possibly under certain conditions which must be met within that period. In principle the period to be specified by the Board is two years.
Register	The national public register as referred to in Section 51 k(1) of the Code of Criminal Procedure, which lists the court experts which the Board deems suitable.
Registered expert	An expert who is entered in the register.
Registration	Entry in the register.

## Annex C Revision History

Version	Date	Revisions made
4.1	Nov 2020	Revised the assessment requirements for Activity level.
4.0	Sept 2020	- Added the subfields of Kinship Analysis and Activity Level. Source Level has been altered to a basic and extended version. - Generic adjustments according to Standards Template 4.0
3.2	Juni 2018	- Generic adjustments: <ul style="list-style-type: none"> <li>• Changes in policy (e.g. provisional registration)</li> <li>• Generic textual changes and harmonisation</li> <li>• Editorial changes in English terminology</li> <li>• Statement NRGD added to Application Form</li> </ul>
3.1	01.08.2017	Peak profiles in Part IV back in Standards.
3.0	01.11.2016	Generic adjustments: <ul style="list-style-type: none"> <li>- addition: generic introduction for all fields of expertise in Part I</li> <li>- adjusted description of types of applicants: independent/work of his own</li> <li>- differentiation per types of applicants to provide an immediate overview of respective requirements (Part III) and assessment procedure (Part IV)</li> <li>- number of hours CPD reduced to 40 hours per year for repeat applicants (instead of 50)</li> <li>- number of case reports adjusted because of extending the registration period;</li> <li>- Continued Professional Development (CPD) mandatory for all types of applicants</li> <li>- possibility to submit profiles that were interpreted and reported on under supervision</li> <li>- possibility to submit profiles that were interpreted and reported on under the supervision of the applicant</li> <li>- integration of several NRGD policy frameworks in Standards</li> <li>- selection of case reports by applicants themselves.</li> </ul>
2.1	01.03.2014	- Y-STRS no longer basic requirement - CPD mandatory for repeat applicant - generic adjustment in assessment procedure regarding repeat applicants B(iv) - adjustment definition complex profile
2.0	28.02.2013	Generic adjustments: <ul style="list-style-type: none"> <li>- Document containing both Demarcation and Requirements and assessment procedure combined</li> <li>- type of applicants</li> </ul>
1.4	25.01.2013	Field of DNA limited to Source level
1.3	01.07.2012	Every report should be subjected to collegial review

1.2	01.02.2011	Modification assessment procedure: an oral examination will not take place if the applicant's expertise has already been clearly demonstrated.
1.1	29.06.2010	Modification assessment procedure
1.0	01.02.2010	First edition