Guidance for Industry

Comparability Protocols — Chemistry, Manufacturing, and Controls Information

DRAFT GUIDANCE

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Food and Drug Administration
Center for Drug Evaluation and Research (CDER)
Center for Biologics Evaluation and Research (CBER)
Center for Veterinary Medicine (CVM)
February 2003
CMC

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Comparability Protocols — Chemistry, Manufacturing, and Controls Information

This draft guidance, when finalized, will represent the Food and Drug Administration's (FDA's) current thinking on this topic. It does not create or confer any rights for or on any person and does not operate to bind FDA or the public. You can use an alternative approach if the approach satisfies the requirements of the applicable statutes and regulations.

If you plan to submit comments on this draft guidance, to expedite FDA review of your comments, please:

- *Clearly explain each issue/concern and, when appropriate, include a proposed revision and the rationale and/or justification for the proposed revision.*
- *Identify specific comments by line numbers; use the pdf version of the document whenever possible.*
- *If possible, e-mail an electronic copy (Word) of the comments you have submitted to the docket to* **cunninghamp@cder.fda.gov**

I. INTRODUCTION

This guidance provides recommendations to applicants on preparing and using comparability protocols for postapproval changes in chemistry, manufacturing, and controls (CMC). The guidance applies to comparability protocols that would be submitted in new drug applications (NDAs), abbreviated new drug applications (ANDAs), new animal drug applications (NADAs), abbreviated new animal drug applications (ANADAs), or supplements to these applications, except for applications for protein products.[2] Well-characterized synthetic peptides submitted in these applications are included within the scope of this guidance. This guidance also applies to comparability protocols submitted in drug master files (DMFs) and veterinary master files (VMFs) that are referenced in these applications.[3] The FDA is providing this guidance in response to requests from those interested in using comparability protocols.

[1] This guidance has been prepared by the Comparability Protocol Working Group, Center for Drug Evaluation and Research (CDER), Center for Biologics Evaluation and Research (CBER), and Center for Veterinary Medicine (CVM) at the FDA.

[2] The general term *product* as used in this guidance means drug substance, drug product, intermediate, or in-process material, as appropriate.

[3] A separate guidance will address comparability protocols for proteins as well as for peptide products outside the scope of this guidance that are submitted in these applications. This separate guidance will also address comparability protocols for products submitted in biologics license applications (BLAs).

FDA guidance documents, including this guidance, do not establish legally enforceable responsibilities. Instead, guidances describe the Agency's current thinking on a topic and should be viewed only as recommendations, unless specific regulatory or statutory requirements are cited. The use of the word *should* in Agency guidances means that something is suggested or recommended, but not required.

II. BACKGROUND

As an applicant, you are responsible for assessing, prior to distribution of a product, the effect of any postapproval CMC changes on the identity, strength, quality, purity, and potency of the product as these factors relate to the safety or efficacy of the product (section 506A(b) of the Federal Food, Drug, and Cosmetic Act (the act)). Such an assessment often includes demonstration that the pre- and postchange products (i.e., products manufactured prior to and subsequent to a change) are equivalent. Postapproval CMC changes must be reported to FDA in one of four reporting categories (Section 506A of the Act):

- Annual Report (AR)

  The annual submission to the approved application reporting changes that FDA has identified as having minimal potential to adversely affect the identity, strength, quality, purity, or potency of a product as they may relate to the safety or effectiveness of the product.

- Change-Being-Effected Supplement (CBE)

  A submission to an approved application reporting changes that FDA has identified as having moderate potential to adversely affect the identity, strength, quality, purity, or potency of a product as they may relate to the safety or effectiveness of the product. A CBE supplement must be received by FDA before or concurrently with distribution of the product made using the change.

- Change-Being-Effected-in-30-Days Supplement (CBE-30).

  A submission to an approved application reporting changes that FDA has identified as having moderate potential to adversely affect the identity, strength, quality, purity, or potency of a product as they may relate to the safety or effectiveness of the product. A CBE-30 supplement must be received by FDA at least 30 days before distribution of the product made using the change.

- Prior Approval Supplement (PAS)

A submission to an approved application reporting changes that FDA has identified as having a substantial potential to adversely affect the identity, strength, quality, purity, or potency of a product as they may relate to the safety or effectiveness of the product. A PAS supplement must be received and approved by FDA prior to distribution of the product made using the change.

In many cases, using a comparability protocol will facilitate the subsequent implementation and reporting of CMC changes, which could result in moving a product into distribution sooner than if a protocol were not used.

This guidance describes the general principles and procedures associated with developing and submitting a comparability protocol to the FDA. The guidance also describes the basic elements of a comparability protocol and specific issues to consider when developing comparability protocols for changes in:

- the manufacturing process
- analytical procedures[4]
- manufacturing equipment
- manufacturing facilities
- container closure systems
- process analytical technology (PAT)

The guidance also discusses submitting comparability protocols in master files.

A. What is a Comparability Protocol?

A comparability protocol is a well-defined, detailed, written plan for assessing the effect of specific CMC changes in the identity, strength, quality, purity, and potency of a specific drug product as these factors relate to the safety and effectiveness of the product. A comparability protocol describes the changes that are covered under the protocol and specifies the tests and studies that will be performed, including the analytical procedures that will be used, and acceptance criteria that will be achieved to demonstrate that specified CMC changes do not adversely affect the product. The submission of a comparability protocol is optional.

B. What is the Benefit of Using a Comparability Protocol?

At the time the application containing the comparability protocol is approved, the FDA can designate,[5] where appropriate, a reduced reporting category for future reporting of CMC changes covered by the approved comparability protocol (see III.A). Furthermore, because a detailed

[4] The term *analytical procedure*, as used in this guidance, includes chemical, physical, microbiological, and biological test procedures.

[5] The term *designate*, in this context, refers to the reporting category agreed to by the applicant and FDA during the review of the submission containing the comparability protocol. See V.A.6.

plan will be provided in the comparability protocol, the FDA is less likely to request additional information to support changes made under the protocol (see IV.D for a potential exception). The use of a comparability protocol could allow an applicant to implement CMC changes and place a product in distribution sooner than without the use of a comparability protocol.

C. Why is a Guidance on Comparability Protocols Being Provided?

For many years, applicants have used protocols to implement certain types of CMC changes, such as to extend an expiration dating period or to demonstrate the interchangeability of certain plastic containers. More recently, there have been many improvements in the techniques for characterizing products, production methods, process controls, and release testing. Because of these improvements and because we are able to better assess the potential effect of CMC changes on a product, protocols are now being used with other types of CMC changes (e.g., manufacturing process, analytical procedure). We have received a number of requests for guidance from applicants interested in using comparability protocols for these other types of changes.

D. Where Can More Information on Postapproval Changes and Demonstration of Equivalence Be Found?

This guidance, once finalized, is not intended to supersede other FDA guidance documents, rather it supplements them with information on using comparability protocols to implement postapproval CMC changes. We recommend that applicants consult all relevant guidances[6] for information relating to postapproval changes. The following guidances provide especially relevant information on (1) demonstrating equivalence, (2) documentation to be provided to support postapproval changes, and (3) the recommended reporting categories.

- *Changes to an Approved NDA or ANDA*
- *Changes to an Approved NADA or ANADA* (draft)[7]
- Various SUPAC documents[8]

[6] Relevant guidance documents can be found on the internet at http://www.fda.gov/cder/guidance/index.htm, http://www.fda.gov/cber/guidelines.htm, or http://www.fda.gov/cvm/guidance/published.htm

[7] This draft guidance is listed for completeness but is not intended for implementation until it has been finalized.

[8] SUPAC (Scale-up and Post-Approval Changes)

III. WHAT TO CONSIDER IN PLANNING A COMPARABILITY PROTOCOL

A. How Does a Comparability Protocol Affect the Reporting of CMC Changes?

A comparability protocol *prospectively* specifies the tests and studies that will be performed, analytical procedures that will be used, and acceptance criteria that will be achieved to assess the effect of CMC changes. A well-planned protocol provides sufficient information for FDA to determine whether the potential for an adverse effect on the product can be adequately evaluated. With a comparability protocol, the FDA can determine if a specified change can be reported in a category lower than the category for the same change, were the change to be implemented without an approved comparability protocol. Typically, categories designated for reporting changes under an approved comparability protocol are one category lower than normally would be the case (e.g., from PAS to CBE-30, CBE, or AR). In some cases, a reduction of more than one reporting category may be possible (e.g., PAS to AR).

B. When Might a Comparability Protocol Be Useful for a CMC Change?

A comparability protocol could be useful for a variety of CMC changes, but there are some exceptions (see Section III.C). In addition, a comparability protocol can describe a single CMC change or multiple related changes. However, we recommend that each change be discrete and specific. A comparability protocol can be particularly useful for changes of a repetitive nature. We recommend that you have sufficient manufacturing information (e.g., developmental studies, manufacturing experience, demonstrated process capability, out-of-specification (OOS) investigations, stability data) with the particular product or process or similar products or processes so you can specify a priori the tests, studies, analytical procedures, and acceptance criteria appropriate for demonstrating that the CMC change or changes will not adversely affect the product. We recommend that comparability protocols be considered for CMC changes that applicants anticipate will be made.

We recommend you consider product-specific and process-specific attributes when determining whether to develop a comparability protocol. Attributes can include, but are not limited to, the following:

- Complexity of the product structure
- Ability to characterize the chemical, physical, microbiological, and biological properties of the product
- Degree to which differences in product structure and physical properties (e.g., polymorph) can be detected
- Degree of product heterogeneity if present
- The effect on safety of changes in the impurities
- The robustness of the product (i.e., the ability of product to remain unaffected by changes)

- Rigorousness of the manufacturing process controls (i.e., the ability of the manufacturing process controls to ensure that the product remains unaffected by changes)

In general, we recommend that a comparability protocol be considered only if the product resulting from the changes is expected to meet the approved drug substance and/or drug product specifications and appropriate and sensitive analytical procedures have been established and validated or qualified (i.e., for nonroutine tests such as characterization studies) to detect the effect of the change on the approved product.

C. When Might a Comparability Protocol Be Inappropriate?

A comparability protocol would be inappropriate for some CMC changes. In some cases, it may be impossible for the changes and/or plan for evaluating the effect of the CMC changes on the product to be fully described a priori. A change may also be too complex to evaluate its effect on the product without efficacy, safety (clinical or nonclinical), or pharmacodynamic or pharmacokinetic (PK/PD) information.

In general, we do not recommend comparability protocols for:

- Broad, nonspecific plans for CMC changes
- A change whose adverse effect on the product cannot be definitively evaluated by prespecified tests, studies, analytical procedures, and acceptance criteria
- Any CMC change that warrants the submission of an IND,[9] INAD, or new original application.
- A CMC change that requires efficacy, safety (clinical or nonclinical), or PK/PD data to evaluate the effect of the change (e.g., certain formulation changes, clinical or nonclinical studies to qualify new impurities)

It may be possible to design a comparability protocol for some of these CMC changes, but FDA may be limited in its ability to designate a reporting category other than PAS for changes implemented under such a protocol. Specific examples of changes that may be difficult to justify under a comparability protocol can include[10]:

- A change in the drug substance or drug product specifications (for exceptions, see V.A.4 and V.C)

[9] INDs may be warranted in certain circumstances, such as for a change from a nontransgenic source to a transgenic plant or animal, a change from one plant or animal transgenic source material to another, or a change in the species of a microorganism or cell line used as source.

[10] In some situations, these changes could warrant the submission of an IND, INAD, or new application.

- A change in the qualitative or quantitative formulation of the drug product.[11]
- A change in the type of delivery system
- A change from plant, animal, or multicellular (e.g., algae, macroscopic fungi) source material to a different one (e.g., different plant species, different tissue and/or plant part, plant to animal)
- A change from synthesis-derived to naturally sourced material and vice versa
- A change from solid phase to liquid phase peptide synthesis and vice versa
- A move to a manufacturing site, facility, or area when a prior approval supplement is recommended because a current good manufacturing practice (CGMP) inspection is warranted (e.g., see examples in guidances listed in II.D.)

IV. PROCEDURES FOR COMPARABILITY PROTOCOLS

A. How Should a Comparability Protocol Be Submitted?

You can submit a comparability protocol in a prior approval supplement or as part of the original application. We recommend that you indicate clearly in the cover letter that you are submitting a comparability protocol.

The submission can consist of the proposed comparability protocol in

- A prior approval supplement that is reviewed and approved prior to generating data supporting the change
- A prior approval supplement that includes the proposed comparability protocol and test and study results as specified in the proposed comparability protocol and any other pertinent information to support a change covered under the protocol. The product already manufactured with the change can be distributed only after approval of the supplement.
- An original application that is reviewed and approved prior to generating data supporting the change

In all cases, a comparability protocol would be reviewed and approved by FDA prior to an applicant implementing a change under the protocol. Furthermore, an applicant who is using an approved comparability protocol to implement postapproval CMC changes must assess the effect of the changes on the identity, strength, quality, purity, and potency of the product as these

[11] A comparability protocol might be useful in certain cases for quantitative changes in excipients, and FDA might designate a reduced reporting category for certain types of products and changes if you have sufficient information to assess the potential effect of the change (e.g., quantitative changes in an excipient beyond the ranges specified in the SUPAC guidances).

factors relate to the safety or efficacy of the product prior to distributing product made with the change. (Section 506A(b) of the act)).

B. How Are Changes and Study Results Submitted After a Comparability Protocol is Approved?

After a protocol is approved, you should document and submit each implemented change within the scope of the protocol using the reporting category designated by FDA. The submission would include (1) the results of all tests and studies specified in your comparability protocol, (2) discussions of any deviations that occurred during the tests or studies, (3) a summary of any investigations performed, and (4) any other pertinent information. To ensure prompt and accurate review, we recommend that you indicate in the cover letter to the submission that it includes data from a change covered under a comparability protocol and provide a reference to the submission in which the comparability protocol was approved.

C. What If Study Results Do Not Meet the Criteria Specified in the Approved Comparability Protocol?

In certain instances, the tests and studies specified in an approved comparability protocol can lead to an unpredicted or unwanted outcome (e.g., test results do not meet predefined acceptance criteria). If this occurs, you can elect not to implement the change. If you decide to pursue the change, you should submit a prior approval supplement that provides the supporting data to justify why the change will not adversely affect the identity, strength, quality, purity, and potency of the specific drug product as these factors relate to the safety and effectiveness of the product.

D. When Does a Comparability Protocol Become Obsolete?

New regulatory requirements, identification of a safety issue (e.g., screening for new infectious agents in materials from a biological source), identification of a new scientific issue, or technological advancement after the comparability protocol has been approved can render a protocol obsolete. We recommend you review the tests, studies, analytical procedures, and acceptance criteria in your approved comparability protocol to ensure they remain current and consistent with the approved application and current FDA policy. We recommend you determine whether the tests, studies, analytical procedures, and acceptance criteria described in your comparability protocol are still appropriate prior to implementing and submitting a change under the protocol. If you find the comparability protocol is no longer correct or adequate, the current protocol should be modified or withdrawn. FDA can request additional information to support a change that is implemented using an obsolete protocol.

E. How is an Approved Comparability Protocol Modified?

You can submit a revised protocol at anytime. Like an original protocol, a revised protocol should be submitted as a PAS to your application following the recommended submission procedures summarized in section IV.A. To ensure prompt and accurate review, we recommend

that you indicate in the cover letter to the submission that it includes a revision to an approved comparability protocol and identify all modifications.

A comparability protocol would be modified to reflect relevant changes in the application. For example, an applicant could request a change in an analytical procedure that is used for release testing but is also cited in an approved comparability protocol. As part of the request to make such a change, FDA recommends that the applicant indicate up front all comparability protocols that will be affected. The specified comparability protocols can be updated as part of this submission using the appropriate reporting category for the change, rather than submitting a separate submission requesting a modification of the comparability protocol. Revisions to a protocol should be approved prior to distributing the product made using the CMC change specified in the protocol.

Editorial changes can also be made. Notification of editorial changes to a comparability protocol can be provided in the AR.

V. CONTENT OF A COMPARABILITY PROTOCOL[12]

We recommend that a comparability protocol be developed and used within the context of existing change control procedures. Such procedures ensure that specified changes do not adversely affect the identity, strength, quality, purity, or potency of the product.

The comparability protocol can describe a single CMC change or multiple changes. Each change should be specified and the acceptance criteria for evaluating the effect of the changes should be well defined. If multiple changes are included in a protocol, we recommend that the multiple changes be interrelated (i.e., one change cannot be made with out the others). For example, a change in a fermentation medium component used to produce an antibiotic can result in more rapid cell growth, which, in turn, causes a higher production rate of antibiotic. Changes related to this change in culture medium could include modification in the length of cell fermentation, increase in harvesting time, and/or changes to purification columns. We recommend that you submit separate comparability protocols for unrelated changes.

A. What are the Basic Elements of a Comparability Protocol?

1. Description of the Planned Changes

A comparability protocol should provide a detailed description of the proposed changes clearly identifying all differences from the conditions approved in the application. A table, diagram, and/or flow chart can be included to help illustrate the differences.

[12] For brevity, the text focuses on comparability protocols submitted in postapproval supplements, although the option is available to include a comparability protocol in an original application.

2. Specific Tests and Studies to Be Performed

A list should be included of the specific tests (e.g., release, in-process) and studies (e.g., characterization, stability, removal of impurities, laboratory-scale adventitious agent removal or inactivation) you will perform to assess the effect of the change on the drug substance, drug product, and/or, if appropriate, the intermediate, in-process material, or component (e.g., container closure system) directly affected by the change. Include the rationale for selecting the particular battery of tests and studies. For example, the use of nonroutine studies (e.g., characterization) can be warranted in cases where in-process or release specifications are not sufficiently discriminatory to evaluate the change.

A protocol should include a plan to compare results from routine batch release testing and, as appropriate, nonroutine testing (e.g., characterization studies) on pre- and postchange products or other material, if appropriate. The protocol should specify the number and type (e.g., pilot, production) of pre- and postchange batches and/or samples that will be compared. The number and type of batches and/or samples to be compared can vary depending on the extent of the proposed change, type of product or process, and available manufacturing information. Retained samples of prechange material can be used for comparison, provided there is no significant change in material on storage (e.g., level of degradants increasing over time). A plan would specify whether retained samples are going to be used and the maximum age of the retained samples, and include information to support the appropriateness of the use of retained samples. In general, the results from postchange material should fall within the normal batch-to-batch variation observed for prechange material.

A comparability protocol should include a plan for the stability studies that will be performed to demonstrate the equivalence of pre- and postchange product. The comparability protocol would provide (1) information that is typically provided in a stability protocol, such as the number and type of batches that will be studied, test conditions, and test time points or (2) a reference to the currently approved stability protocol. The amount of stability data that will be generated before the product made with the change is distributed would be specified. The plan for evaluating stability could vary depending on the extent of the proposed change, type of product, and available manufacturing information. In some cases, no stability studies may be warranted or a commitment to report results from stability studies in an AR can be sufficient. If no stability studies are planned, we recommend that this be stated clearly.

The differences, if any, in the tests and studies from those previously reported in the approved application or subsequent updates (i.e., supplements, annual reports) would be described. We recommend you identify the location in your application of any referenced tests or studies.

3. Analytical Procedures to be Used

A protocol should specify the analytical procedures that you intend to use to assess the effect of the CMC changes on the product or intermediate material. Analytical procedures would be chosen capable of detecting new impurities or other changes in a product that can result from the change.

Since the current approved analytical procedures are optimized for the approved product and process, modified or new procedures may be warranted. For example, revised or new analytical procedures can be called for to monitor the removal of a new process impurity generated by a new manufacturing process. In this situation, submission of results for pre- and postchange products using both the old and new analytical procedures may be warranted. Studies performed to assess the feasibility of the proposed change can often be helpful in determining whether the current approved analytical procedures will be appropriate for assessing the effect of the change on the product (see V.A.5). Validation of new modified analytical procedures or revalidation of existing analytical procedures should be performed, as appropriate. The protocol would specify that any new or revised analytical procedures and the appropriate validation or revalidation information would be provided when a postapproval CMC change implemented using the approved comparability protocol is reported to FDA.

In some instances, analytical procedures are used in the characterization and/or assessment of the functionality of a product, but not for batch release or for process control (e.g., X-ray crystallography, plume geometry for metered dose inhalers). If these analytical procedures are not routinely used for process or release testing, you do not have to report changes in these analytical procedures (e.g., when they are used only for drug development). However, if these analytical procedures are specified in and provided as part of a comparability protocol, any new or revised analytical procedures and, as appropriate, results from validation or qualification studies for any modified procedure would be provided when a postapproval CMC change implemented using the approved comparability protocol is reported to FDA.

In cases where changes in analytical procedures are intended to be implemented independent of other CMC changes, we recommend that a comparability protocol specific for analytical procedure changes be submitted (see V.C)

4. Acceptance Criteria

You should include the acceptance criteria (numerical limits, ranges or other criteria) for each specified test and study that will be used to assess the effect of the CMC changes on the product or other material and/or demonstrate equivalence between pre- and postchange material. In general, the drug substance and drug product specification would be identical to that in the approved application. Any statistical analyses that will be performed and the associated evaluation criteria would be identified.

If implementing a change using a comparability protocol calls for a revision of the drug product or drug substance specification, we recommend you consider the recommended reporting category[13] for the type of specification change as well as the designated reporting category for reporting a change using your comparability protocol. When the recommended reporting category for the specification change is higher (e.g., PAS) than the reporting category for

[13] For example, the recommended reporting categories for specification changes found in the guidance on *Changes to an Approved NDA or ANDA*.

changes made under the comparability protocol (e.g., CBE-30), the change would be reported as recommended for the specification change. If the recommended reporting category for the specification change is the same or lower than the designated reporting category for changes made under the comparability protocol, the specification can be updated and provided when a postapproval CMC change implemented using the approved comparability protocol is reported to FDA.

5. Data to Be Reported Under or Included With the Comparability Protocol

You should identify the type (e.g., release, long-term or accelerated stability data) and amount of data (e.g., 3-months accelerated stability data) that will be submitted at the time a postapproval CMC change implemented using the approved comparability protocol is reported to FDA and, when appropriate, generated prior to your distributing the product made with the change (e.g., when proposed reporting category is a CBE-30, CBE-0, or AR).

If available, you can include any data from studies performed to assess the feasibility of the proposed change with the proposed comparability protocol. Data obtained from a small-scale process or other studies incorporating the proposed change can provide preliminary evidence that the change is feasible, as well as preliminary information on the effect of the change on the product. Development or feasibility studies can provide insight into the relevance and adequacy of the choice of the battery of tests you have identified to assess the product.

6. Proposed Reporting Category

The use of an approved comparability protocol may justify a reduction in the reporting category for the particular CMC change when implemented (see III.A). We recommend you include a proposal for the reporting category that you would use for changes implemented using the approved comparability protocol. FDA will evaluate your proposed reporting category as part of its review of the comparability protocol and communicate any concerns about your proposal. Agreement by the applicant and FDA on the reporting category for the specified CMC changes will be part of the process of approving the comparability protocol.

7. Equivalence Not Demonstrated Using the Approved Comparability Protocol

It is anticipated that some changes in the manufacturing process will result in a postchange product that cannot be demonstrated to be equivalent to the prechange product without more extensive physicochemical, biological, pharmacology, PK/PD, efficacy, or safety testing or in a product that does not meet the prespecified acceptance criteria in the protocol. You should identify in the protocol the steps you will take in such circumstances.

8. Commitment

You should include a commitment in your comparability protocol that you will update or withdraw your protocol when it becomes obsolete (see section IV.D)

B. Does FDA Have Specific Concerns About Changes in the Manufacturing Process That Should Be Addressed in a Comparability Protocol?

In addition to the general considerations provided in section V.A, we recommend that you consider the following issues for changes in the manufacturing process, where applicable:

1. Comparison of Physical Characteristics

A comparability protocol would normally include a plan to compare the physical characteristics (e.g., polymorph forms, particle size distribution) of the product produced using the old and new processes when these characteristics are relevant to the safety and/or efficacy of the product.

2. Comparison of Impurity Profiles

A comparability protocol would include a plan to determine the impurity profile of the product produced using the new process. The studies would assess product-related impurities and process-related impurities, including, if applicable in-process reagents and catalysts. We recommend that attention be given to demonstrating the absence of any new impurities or contaminants, or that they are removed or inactivated by downstream processing. Any changes in the impurity profile would meet the predefined criteria (see section V.A.4). The predefined criteria would indicate when qualification studies will be warranted to evaluate an increased level of an existing impurity or a new impurity (or an applicant could reference a relevant FDA guidance that recommends qualification levels).

If during implementation of a change under an approved comparability protocol, the data indicate that nonclinical or clinical qualification studies for impurities are warranted, the change would not be appropriate for implementation under the approved comparability protocol (see III.C and V.A.7)

3. Effect on Downstream Processes

We recommend that the effect of the change on downstream processes be examined. Downstream processes such as purification steps can be affected by higher product yields or shifts in impurity profiles when upstream processes are modified. For example, adventitious agent removal or inactivation may have to be reassessed for processes involving materials or reagents derived from a biological source. A comparability protocol would discuss how to ensure that the entire manufacturing process is adequately controlled.

514 *4. Effect on Process Controls and Controls of Intermediates and/or In-process*
515 *Materials*
516
517 We recommend you identify and justify implementation of new controls or variations from
518 approved controls. We recommend a statement be included that controls, including those that
519 have been validated to inactivate and remove impurities or contaminants, will be revalidated for
520 the new production process, if appropriate.
521
522 **C. Does FDA Have Specific Concerns About Changes in Analytical Procedures**
523 **That Should Be Addressed in a Comparability Protocol?**
524
525 A comparability protocol for changing an analytical procedure would provide the plan for
526 validation of the changed analytical procedure and indicate whether the protocol will be used to
527 modify the existing analytical procedure (i.e., retaining the same principle), or to change from
528 one analytical procedure to another (e.g., normal to reverse phase HPLC). The comparability
529 protocol would be designed to demonstrate that the proposed changes in the analytical
530 procedures improve or do not significantly change characteristics used in methods validation that
531 are relevant to the type of analytical procedure (e.g., accuracy, precision, specificity, detection
532 limit, quantitation limit, linearity, range).[14]
533
534 Methods validation includes an assessment of the suitability of the analytical procedure. A
535 validation plan would have prespecified acceptance criteria for relevant validation parameters
536 such as precision, range, accuracy, specificity, detection limit, and quantitation limit. The
537 proposed acceptance criteria for these parameters would ensure that the analytical procedure is
538 appropriate for its intended use. The validation plan would assess whether a revised procedure is
539 more susceptible than the original procedure to matrix effects by process buffers/media, product-
540 related contaminants, or other components present in the dosage form. A plan would identify
541 any statistical analyses that will be performed and whether product testing to compare the two
542 procedures is intended. The need and plan for providing product testing to compare the two
543 procedures could vary depending on the extent of the proposed change, type of product, and type
544 of test (e.g., chemical, biological).
545
546 When used for release or process control, use of the new revised analytical procedure should not
547 result in deletion of a test or relaxation of acceptance criteria that are described in the approved
548 application.
549
550 **D. Does FDA Have Specific Concerns About Changes in Manufacturing**
551 **Equipment That Should Be Addressed in a Comparability Protocol?**
552

[14] Guidance on validation of analytical procedures can be found in the ICH guidances *on Q2A Text on Validation of Analytical Procedures* and *Q2B Validation of Analytical Procedures: Methodology* or VICH guidances on *GL1 Validation of Analytical Procedures: Definition and Terminology* and *GL2 Validation of Analytical Procedures: Methodology* .

Comparability protocols may be most useful if applicants are planning to change to equipment with a different operating principal. Equipment changes are often made in conjunction with changes to the manufacturing process. We recommend that you evaluate this type of change with respect to its effect on the production process prior to deciding whether or not a comparability protocol would be appropriate.

E. Does FDA Have Specific Concerns About Changing Manufacturing Facilities That Should Be Addressed in a Comparability Protocol?

The utility of a comparability protocol is often limited due to the scope of the change and the need, in some cases, for an inspection. For example, a move to a new facility can involve many changes (e.g., new equipment, modified manufacturing process) that are difficult to prospectively identify as part of a comparability protocol because the new facility is unknown or not constructed at the time the comparability protocol is being considered. We recommend you consider carefully the appropriateness of a comparability protocol for a facility change that involves many other changes.

We recommend a statement be included in the comparability protocol for changing manufacturing facilities saying that a move to a different drug substance or drug product manufacturing site will be implemented only when the site has a satisfactory CGMP inspection for the type of operation. Furthermore, in the case of aseptically processed product, the statement would also indicate that a move to a different facility or area (e.g., room or building on a campus) will be made only when the specific facility or area has a satisfactory CGMP inspection (irrespective of the overall CGMP status for the campus). For a move to another type of site (e.g., drug substance intermediate manufacturing site, testing laboratory), a statement would be included that the move to this site would not be implemented if there were an unsatisfactory CGMP inspection for the site.[15]

F. Can a Comparability Protocol Be Used for Container Closure System Changes?

In the past, applicants have used protocols for container closure system changes, and they can continue to use them. A comparability protocol can be particularly useful for repetitive container closure system changes.

G. Can Implementation of or Changes in Process Analytical Technology (PAT) Be Addressed in a Comparability Protocol?

[15] A satisfactory CGMP inspection is an FDA inspection during which (1) no objectionable conditions or practices were found (No Action Indicated (NAI)) or (2) objectionable conditions were found, but corrective action is left to the firm to take voluntarily and the objectionable conditions will not be the subject of further administrative or regulatory actions (Voluntary Action Indicated (VAI)).

FDA anticipates that implementation of or changes in PAT could be addressed in a comparability protocol. Early dialogue with FDA is encouraged. The FDA intends to publish a guidance on PAT in the future.

H. Can a DMF or VMF Be Cross-Referenced in an Applicant's Comparability Protocol?

A master file can be cross-referenced in a comparability protocol that provides for CMC changes (e.g., new manufacturer of drug substance, container resin). The protocol would include a commitment to provide a letter authorizing the FDA to review the master file when a postapproval CMC change implemented using the approved comparability protocol is reported to FDA. The comparability protocol would also indicate the type of information (e.g., manufacturing and formulation information for a plastic resin) that will be referenced in the master file and the information that you will provide such as the studies you will perform to demonstrate the suitability of the new material (e.g., conformance to approved specification, compatibility studies, stability studies).

I. Can a Comparability Protocol Be Included in a DMF or VMF?

A comparability protocol can be included in a master file. The protocol can be cross-referenced for CMC changes. An applicant's submission must include a letter authorizing the FDA to review the master file (e.g., 21 CFR 314.420(b)). Comparability protocols are product specific. Therefore, the applicant's submission would provide a comparability protocol that augments the information provided in the master file by specifying, for example, any additional studies that will be performed to demonstrate suitability of the postchange material (e.g., conformance to approved specification, compatibility studies, stability studies). The FDA ordinarily neither independently reviews master files nor approves or disapproves submissions to a master file.