Guide for Visual Inspection of Deterioration & Damages on Suspension NCI's

STRI

NCI Visual Inspection Guide
- Overview Presentation -

- **Background**
- **Aim**
- **Design & Approach**
- **How to Use the Guide**
- **Use with the CIS Program:**
  - **Aim & benefits**

Background

- **All polymers will age over time**
- **Ageing depends on formulation, vintage, manufacturing, shed profile, operating stresses, service environment, handling**

- ***What is the condition of NCI's in service?***
- ***Does the utility need to take action?***

Aim of NCI Guide

- **Simplify in-service inspection of NCI's for utility maintenance personnel:**
  - **to collect in-service data**
  - **to make first decision on action yes/no**
- **Target group: inexperienced and experienced linemen**
- **Also to be used with STRI's free CIS (Composite Insulator Status) program**

Design & Approach

- **Reference table with Insulator Profile (easy-to-understand) diagram**
- **NCI and descriptions are separated into 6 areas**

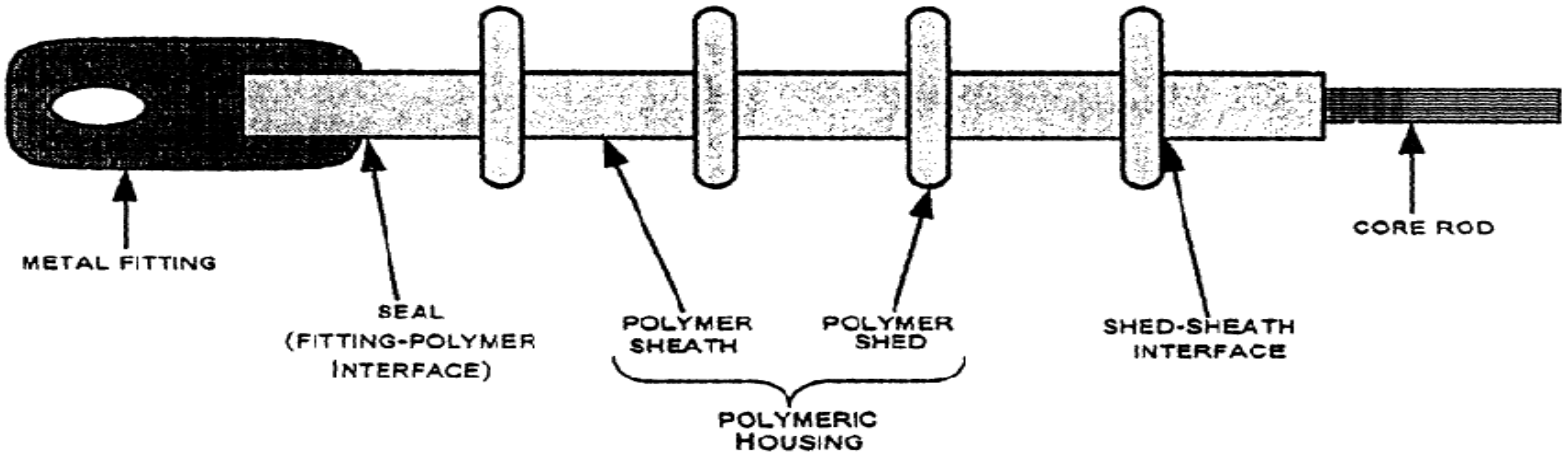

Figure 2-1 Typical Structure and Components of a Suspensior Composite Insulator

Design & Approach (cont.)

- **Definitions (IEC, CEA, ANSI or STRI) are provided for each photo**
- **Two versions - Paper and Electronic “PDF” version with a clickable Master Reference Table**
- **No intent to target or attack specific NCI designs or manufacturers**

How to Use Guide

	Deterioration or Damages	Section 3.1 Page 9	Section 3.2 Page 10	Section 3.3 Page 12	Section 3.4 Page 16	Section 3.5 Page 21	Section 3.6 Page 23
Deterioration	Chalking		*(fig 14)*	*(fig 14)*	fig 14	-	
	Colour Changes		*(fig 13)*	*(fig 13)*	fig 13	*(fig 13)*	
	Corrosion of Fitting	fig 1					
	Crazing		*(fig 15)*	*(fig 15)*	fig 15	*(fig 15)*	
	Erosion		fig 6	fig 6	-	-	
	Fracturing		*(fig 16)*	*(fig 16)*	fig 16	*(fig 16)*	
	Grease Leakage					fig 21	
	Splitting		*(fig 7)*	fig 7		fig 22	
	Hydrophobicity Reduction		Refer to STRI Hydrophobicity Classification Guide 1, 92/1				
Damage	Brittle Fracture	*(fig 24)*					fig 24
	Burning /Tracking		fig 10	fig 11	fig 18	fig 10	-
	Corona Cutting		*(fig 12)*	fig 12	-	-	
	Debonding		*(fig 3)*	-		fig 22	
	Erosion		fig 4	fig 8	*(fig 8)*	-	
	Exposure of the Core		-	fig 9		*(fig 9)*	fig 23
	Hydrolysis		*(fig 17)*	*(fig 17)*	fig 17	-	
	Peeling		fig 3				
	Power Arc Damage	fig 2	*(fig 2)*	-	-	-	
	Puncture		fig 5	fig 12	fig 19	-	
	Splitting		-	*(fig 7)*	fig 20	-	
	Vandalism	-	*(fig 23)*	*(fig 23)*	*(fig 23)*	*(fig 23)*	*(fig 23)*

Description and Examples
- Deterioration -

- **Cosmetic or superficial ageing of NCI resulting from exposure to service environment, electrical & mechanical stresses, etc.**
- **NOT expected to cause a significant reduction in NCI's performance and/or longevity. <u>No action needed</u>**
- **Chalking, Colour Changes, Light Erosion, Fitting Corrosion, Crazing, Minor Loss of Hydrophobicity, etc.**

Description and Examples
- Damages -

- **Permanent changes to NCI from progress of deterioration and/or external influences**
- **Expected to have a negative impact on NCI's performance and/or longevity. <u>Action is needed</u>**
- **Brittle Fracture, Burning / Tracking, Corona Cutting, De-bonding, Severe Erosion, Exposure of Core, Hydrolysis, Seal Peeling, Shed Puncture, Vandalism, etc.**

Related activity
CIS Program: Aim & Benefits

To provide utilities (free of charge) with basic knowledge for decisions on:

- **maintenance on already installed NCI's**
- **selection of NCI's for future installation**

by:

- **sending utility inspection data to STRI**
- **STRI providing annual report with analysis of all obtained inspections**

CIS Inspection Program Details

Fill in STRI information forms:

- **Environmental data**
- **Climatic data**
- **Annual visual inspections:**
  - **Visual inspection according to STRI NCI Guide**
  - **Hydrophobicity measurements according to STRI HC Guide**

Summary

- **FREE NCI Guide simplifies for maintenance personnel in-service inspection and process of taking actions**
- **FREE participation in CIS program gives even more reliable data for:**
  - **maintenance of existed NCIs**
  - **selection of new NCIs**

More information

Guide for Visual Inspection of Deterioration & Damages on Suspension NCI's

- **Request for copy or suggestions <nci.damage.guide@stri.se>**

CIS Program

- **Request for copy or suggestions <cis@stri.se>**