Semirigid Domain is a generalization of a GUFD. And to display another feature of Semirigid Domains we prove the following

Theorem 2. Let R be a Semirigid Domain, then there exists a family $\Phi = \{ P_\alpha \}$ ($\alpha \in I$ an index set) of prime ideals of R such that

(1) $R_{P\alpha}$ is a valuation domain for each $\alpha \in I$

(2) each non zero non unit $x \in R$ is contained in only a finite number of members of Φ

(3) $P_{\alpha_1} \cap P_{\alpha_2}$ does not contain a non zero prime ideal if $\alpha_1 \neq \alpha_2$, $\alpha_i \in I$

(4) $R = \cap R_{P_\alpha}$, $\alpha \in I$.

Proof . By part(3) of Lemma 1, in an HCF domain R, corresponding to each rigid non unit r, there exists a prime ideal $P(r) = \{ x \in R \mid (x,r) \neq 1 \}$ associated to r, and by (4) of Lemma 1, $P(r) = P(s)$ iff s is a rigid non unit non co-prime to r.

Now let Γ be a set of mutually co-prime rigid non units r_α of the given Semirigid domain R, where $\alpha \in I$ an index set. According to the above observation we have a family of prime ideals $\Phi = \{ P(r_\alpha)(= P_\alpha) \mid r_\alpha \in \Gamma \,;\, \alpha \in I \}$, and by part (5) of Lemma 1, $R_{P_\alpha} = R_{P(r_\alpha)}$ is a valuation domain for each $\alpha \in I$, that is (1) holds for the selected family Φ .

Since R is a Semirigid Domain, each non zero non unit being a product of a finite number of mutually co-prime rigid non units is a member of at most a finite number of elements of Φ , that is (2) also holds for Φ .

Now let Q be a non zero prime ideal contained in the intersection $P_{\alpha_1} \cap P_{\alpha_2} \equiv P(r_{\alpha_1}) \cap P(r_{\alpha_2})$, $(P_{\alpha_1} \neq P_{\alpha_2})$ and let $x \in Q$. Then since x is semirigid