Let E be a directed graph, and $\alpha \in E^*$ such that $|r^{-1}\{s(\alpha)\}| = \infty$. Let $X, Y \subseteq_{\text{fin}} E(S(E))$, and Z be a finite cover of $E^{X,Y}$. If $\xi_\alpha \in \mathcal{U}(X,Y)$, then $\xi_\alpha \cap Z \neq \emptyset$. Proof:

First note:

$$\begin{aligned} E^{X,Y} &= \{e \in E(S(E))\colon\ e \leq x\ \forall x \in x \text{ and } ey = 0\ \forall y \in Y\} \\ &= \{e \in E(S(E))\colon\ e \leq\ \min(X) \text{ and } ey = 0\ \forall y \in Y\} \\ &= E^{\{\min(X)\},Y} \end{aligned}$$

Letting $\min(X) = (x, x)$,

$$E^{X,Y} = \{(xx', xx')\colon\ x' \in E^*,\ r(x') = s(x) \text{ and } (xx', xx')y = 0\ \forall y \in Y\}$$

Consider the set $C := \{(\alpha b, \alpha b)\colon\ b \in E^1,\ s(\alpha) = r(b)\}$. By the assumption that $s(\alpha)$ is an infinite receiver, C is infinite. Given $y \in Y$, let ν be the path corresponding to y. Since $\xi_\alpha \in \mathcal{U}(X,Y)$, ν is not a prefix of α, and thus not a prefix of αb for any b. Thus, if $(\alpha b, \alpha b)y \neq 0$, αb is a prefix of ν. Then for $\beta \neq b$, $\alpha\beta$ cannot be a prefix of ν. So there is at most one element of C such that $(\alpha b, \alpha b)y \neq 0$. By the assumption that Y is finite, all but finitely many elements of C are inside $E^{\{(x,x)\},Y}$. Therefore, if Z is a cover of $E^{X,Y}$, Z is a outer cover of the infinite set $E^{X,Y} \cap C$. Because Z is finite, $\exists z \in Z$ such that $(\alpha b, \alpha b)z \neq 0$ for infinitely many $(\alpha b, \alpha b) \in E^{X,Y} \cap C$.